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2000

EPA Superfund
Record of Decision Amendment:

OLD CITY OF YORK LANDFILL
EPA ID: PAD980692420
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03/31/2000

RECORD OF DECISION AMENDMENT
OLD CITY OF YORK LANDFILL SUPERFUND SITE
YORK COUNTY, PENNSYLVANIA

DECLARATION

SITE NAME AND LOCATION

Old City of York Landfill Site
Springfield Township, York County, Pennsylvania

STATEMENT OF BASIS AND PURPOSE

This Record of Decision Amendment ("ROD Amendment") modifies the selected remedy described in the Record of Decision for the Old City of York Landfill Superfund Site ("Site") issued by the U.S. Environmental Protection Agency ("EPA") on September 30, 1991 ("1991 ROD"). In the 1991 ROD, EPA selected a ground water pump and treat remedy to remediate contaminated ground water at the Site. The current remedial action (ground water recovery and treatment) selected for the Site is only marginally effective. Estimates of the total volatile organic compound ("VOC") recovery by the pump and treat system indicates that less than one pound per year is being recovered compared to the loss of 11 pounds per year through natural attenuation processes. Continued operation of the existing pump and treat system adds little additional benefit toward remediation of the ground water at the Old City of York Landfill Site. VOC levels are overall at very low levels, particularly along the Site boundaries. Continued operation of the pump and treat system is not expected to significantly reduce off-property migration of VOCs.

This decision document presents the selected remedial action for contaminated ground water at the Old City of York Landfill Site. These selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended, ("CERCLA") and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP").

The Commonwealth of Pennsylvania concurs with the selected remedy for the Old City of York Landfill Superfund Site described in this ROD Amendment.

ASSESSMENT OF THE SITE

The response action selected in this ROD Amendment is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

This response action addresses contaminated ground water at the Old City of York Landfill

Site. The 1991 ROD addressed the contaminated ground water by using a ground water pump and treat system. That remedy has proven to be only marginally effective in reducing ground water contamination at the Site.

The selected remedy in this ROD Amendment includes the following major components:

- Monitoring of natural attenuation processes to measure changes in contaminant concentrations in the ground water at the Site until the cleanup levels are achieved.

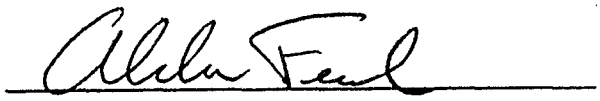
- Placement of institutional controls (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) prohibiting ground water extraction from existing wells or the installation of any new wells, as necessary, to prevent migration of the contaminant plume off the landfill property boundary.

- Initiation of a ground water pump and treat contingent remedy if EPA determines, in consultation with the Pennsylvania Department of Environmental Protection (PADEP), that natural attenuation processes are not protective of human health and the environment. Should a contingent remedy be triggered, an Explanation of Significant Differences ("ESD") or ROD Amendment would be required.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate, and is cost-effective. EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a cost-effective manner at the Site. The selected remedy does not require treatment because the current remedy (ground water extraction and treatment) achieves only marginal additional protection in relation to the additional cost.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a statutory review will be conducted every five years after the commencement of the remedial action to ensure that human health and the environment continue to be adequately protected by the remedy. Since the original 1991 ROD remedial action commenced in November 1995, the first five year review for this Site will be conducted by November 2000.



3/31/00

Abraham Ferdas, Director
Hazardous Sites Cleanup Division
U.S. EPA, Region III

Date

DECISION SUMMARY
OLD CITY OF YORK LANDFILL SUPERFUND SITE

INTRODUCTION

The Old City of York Landfill Site ("Site") is a former municipal waste landfill that was operational from 1961 to 1975 and was intended to receive only municipal waste. The landfill was owned and operated by the City of York until 1968, at which time the operation of the landfill was transferred to private firms which were under contract with the City of York. Material disposed of at the landfill was predominantly municipal refuse with some commercial and industrial wastes. The U.S. Environmental Protection Agency ("EPA"), following consultation with the Pennsylvania Department of Environmental Protection ("PADEP"), is issuing this Record of Decision Amendment ("ROD Amendment") to address contaminated ground water at the Site. The selected remedy described in this ROD Amendment was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, U.S.C. §§ 9601 et al. ("CERCLA"), and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP").

In 1991 EPA issued a Record of Decision ("ROD") for a ground water pump and treat remedy to remediate contaminated ground water at the Site. This ROD Amendment addresses the contaminated ground water by discontinuing the operation of the existing ground water extraction and treatment system and relying on monitored natural attenuation ("MNA") to attain the ground water cleanup standards specified in the 1991 ROD. All other aspects of the remedy selected in the 1991 ROD will remain unchanged. This ROD amendment also establishes a contingent remedy for restarting the existing pump and treat system if EPA determines, in consultation with PADEP, that the MNA remedy is not protective of human health and the environment. Should a contingent remedy be triggered, an Explanation of Significant Differences ("ESD") or ROD Amendment would be required.

In accordance with Section 117 of CERCLA, 42 U.S.C. § 9617, the Focused Remedial Investigation/Feasibility Study Report ("Focused RI/FS"), Proposed Remedial Action Plan ("Proposed Plan"), and background documentation for the Old City of York Landfill Superfund Site were made available to the public on September 10, 1999 in the local information and administrative record repository at the Jacobus Village Library, Jacobus, Pennsylvania. In accordance with Section 300.825 (a)(2) of the NCP, this ROD Amendment will become part of the administrative record file. The administrative record file is available for review at the following locations:

Village Library
35 C North Main Street
Jacobus, Pa. 17407
(717) 428-1034

A copy of the administrative record file is also available to the public at the EPA Region III offices, 1650 Arch Street, Philadelphia, Pennsylvania, 19103.

U.S. EPA Docket Room
Contact: Ms. Anna Butch (3HS01)
Administrative Record Coordinator
1650 Arch Street
Philadelphia, PA 19103
(215) 814-3037
Hours: Mon-Fri
8:30 AM - 4:30 PM

For a detailed description of the Site background and Site characteristics, refer to the 1991 ROD, Focused RI/FS, and the Proposed Plan for this ROD Amendment.

SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

A. History

The Old City of York Landfill Superfund Site (the "Site") is located in a rural setting approximately 10 miles south of the City of York, on South Road in Springfield Township, York County, Pennsylvania. According to local tax maps, the Site occupies a 178-acre tract of land. Approximately 56 acres of the Site were actually landfilled.

The Old City of York Landfill was operational from 1961 to 1975 and was intended to receive only municipal wastes. The landfill was owned and operated by the City of York until 1968, at which time the operation of the landfill was transferred to private firms which were under contract with the City of York. Material disposed of at the landfill was predominantly municipal refuse with some commercial and industrial wastes. Refuse was disposed in three areas: Areas 1, 2, and 3 (Figure 1). The landfill was closed in 1975, and the property was sold to Dr. Roger and Mary Lou Boser in 1978. The Bosers currently own and reside on the Site property. The Site is currently used mainly for grazing of horses and recreation by the current landowner, and a small northern section of the Site (not over landfilled areas) is leased to grow crops for animal consumption.

Based on questions concerning water quality raised by local private residents in the early 1980's, a residential well sampling program was undertaken to analyze well samples for volatile organic compounds ("VOCs"), metals and other water quality parameters. VOCs were reported in six residential wells located adjacent to the Site. As a result of the presence of VOCs in these residential wells, a public water main was installed along South Road from the Town of Seven Valleys, located 1.5 miles northwest of the Site. In 1982, a construction moratorium was recommended to Springfield Township by the Pennsylvania Department of Environmental Protection ("PADEP"). Ground water usage restrictions are discussed in more detail in the Risk Assessment portion of this document.

FIGURE 1

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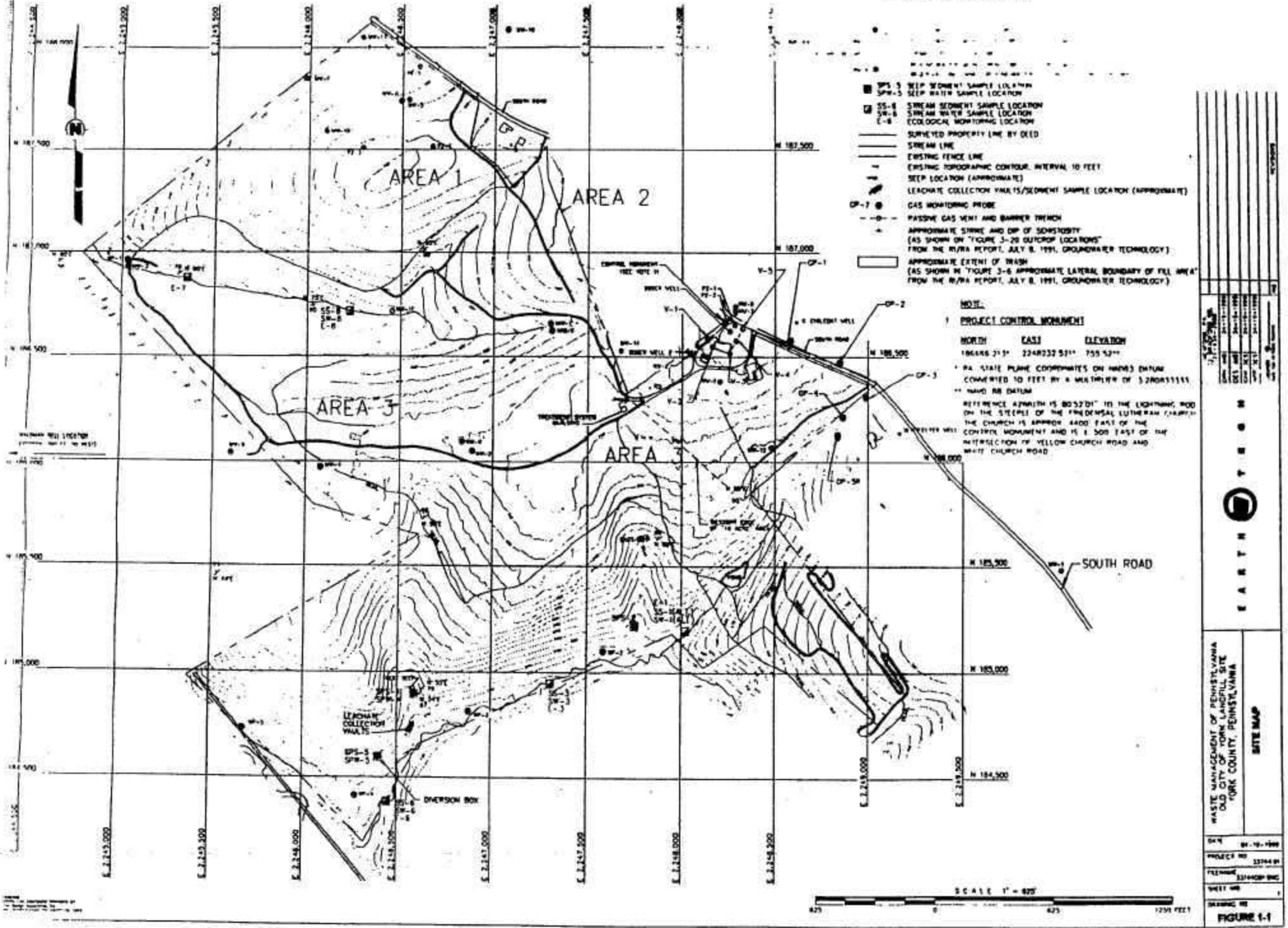


B. Enforcement Activities and History of Regulatory Involvement

Under the provisions of CERCLA, the Site was placed on the National Priorities List ("NPL") in December 1982 with a hazard ranking score ("HRS") of 31.09. On October 27, 1987, the City of York, Rite-Way Services, and Alleco, Inc. (on behalf of the Macke Company and Service America Corporation) entered into an Administrative Order on Consent with EPA to conduct the original remedial investigation and feasibility study ("RI/FS") for the Old City of York Landfill Site.

Based on a review of chemical concentrations measured in ground water monitoring wells on-site during the original remedial investigation, federal and state drinking water standards, referred to as maximum contaminant levels ("MCLs"), were exceeded for the following chemicals: 1,2-dichloroethane, tetrachloroethene, 1,1,2-trichloroethane, trichloroethene, and vinyl chloride.

On April 9, 1991, a restrictive covenant was placed on the entire 178-acre tract by the property owner which prevents: ground water and surface water usage; further development or subdivision of the property; the use of additional areas for agriculture; and disturbance of the surface soils for any purpose except as required by the United States or Commonwealth of Pennsylvania.

Based on the results of the original RI/FS, EPA issued a Record of Decision ("ROD") for the Old City of York Landfill Site on September 30, 1991. The selected remedy included:

- Restoration of the soil cover in the northeastern portion of Refuse Area 3 to a two foot minimum;
- Operation of a ground water recovery/treatment system in both refuse Areas 1 and 3 and the installation of additional extraction wells in these areas, if needed;
- Removal of sediments from the concrete collection vaults with subsequent disposal at an off-site permitted treatment, storage, or disposal facility (sediments were allowed to be disposed of on-site under the soil cover pursuant to an Explanation of Significant Differences ("ESD") dated September 27, 1996);
- Installation of a landfill gas venting system to prevent landfill gas migration;
- Construction of a perimeter fence at the leachate collection vaults to prevent public access, and;
- Implementation of a ground water and surface water/sediment monitoring program to ensure continued protection to human health and the environment.

The ROD stated that the ground water extraction system would continue to operate until clean up standards for contaminants were reached throughout the areas of attainment. The area of

attainment is defined to encompass the area outside the boundary of Areas 1 and 3 and up to the boundary of the contaminant plumes. To evaluate the effectiveness of the ground water extraction and treatment system, the ROD required that ground water be monitored on a quarterly basis until the cleanup levels were achieved.

EPA issued a Unilateral Administrative Order ("UAO") on June 30, 1992, to the following parties for the performance of the remedial design/remedial action ("RD/RA") at the Old City of York Landfill Site: Rite-Way Services, Inc. (predecessor to Waste Management of Pennsylvania, Inc.); Stewart and March, Inc.; York Wrecking Company Inc.; Service America, Corporation; Litton Industrial Automation Systems; Inc.; and A.B. Chance Company, Inc. The RD was completed in May 1995. The remedial action contract was awarded on October 13, 1995, and construction started on November 6, 1995. A Preliminary Construction Completion Report ("PCOR") was issued on September 27, 1996, documenting that remedial construction activities were substantially complete. The ground water pump and treat system commenced operation in June 1996 prior to the completion of all the construction activities at the Site.

The Final Remedial Design provided for ground water extraction in two areas which historically had the highest levels of volatile organic compounds ("VOCs") in ground water: Area 1 (MW-5 and RW-3 wells) and the northeast section of Area 3 (Boser, RW-1, and RW-2 wells). The ground water recovery system consisted of the installation of submersible pumps and wellhead equipment at five extraction wells, installation of a ground water conveyance system, and construction of a ground water treatment building which houses an air stripper and off-gas treatment systems for removal of VOCs from extracted ground water and off-gases, with discharge of treated water to an on-site surface waterway.

Start up of the ground water extraction and treatment system occurred on June 17, 1996. Since that time, the extraction and treatment system has been in virtually continuous operation, excluding minor downtime, and has been operating as designed.

BASIS FOR THE DOCUMENT

I. Introduction

On September 1, 1998, Waste Management of Pennsylvania, Inc. ("WMPA") submitted a formal request and proposed scope of work to EPA to modify the remedy by possibly replacing the existing ground water extraction and treatment system with monitored natural attenuation ("MNA") to complete the cleanup of the ground water to MCLs in Area 1 and Area 3 in conjunction with institutional controls ("ICs") (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) to ensure protection of human health and the environment. Specifically, the ICs would prevent the installation of any new ground water wells and/or ground water extraction from existing wells, as necessary, to prevent migration of the contaminant plume off the landfill property boundary.

WMPA, in coordination with EPA, implemented the following work to collect the information needed to support a remedy modification. The following activities were performed: (1) the installation of three (3) new monitoring wells, MW-13, MW-14, and MW-15 at the Site; (2) the execution of third quarter 1998 monitoring which included sampling of the ground water monitoring well network and performing annual surface water and sediment monitoring; (3) the identification of the required ground water usage restriction areas to ensure protection of human health.

On November 9,1998, WMPA submitted the report entitled the "Alternative Ground Water Remedy Evaluation Report" which documented the results of the additional field work and compared the MNA/institutional control remedy to the existing pump and treat remedy as designed and implemented. For ease and consistency with accepted nomenclature, this report will be referred to as the Focused Remedial Investigation/Feasibility Study or "Focused RI/FS" in this ROD Amendment.

II. Findings of the Focused RI/FS

A review of ground water elevations at the Site reveals that ground water flow patterns generally follow surface topography. For Area 1, ground water flow from the landfilled areas is downslope from the hill on which Area 1 occurs resulting in flow to the northwest, southwest, and southeast directions toward inner portions of the Site. For the northeast section of Area 3, the other area which typically has had the highest levels of VOCs in ground water, ground water flow is generally in a radial type pattern from the top of the hill on which the Boser residence is located.

A total of 21 wells were sampled for the natural attenuation study as part of the Third Quarter 1998 sampling event at the Site (Figure 1). For Area 1 wells, as expected based on historical data, wells MW-5 (extraction well), PZ-3 (interior well) and RW-3 (extraction well) contained the highest levels of VOCs. Similarly, wells MW- 11 (interior well) and MW-F (property boundary well) exhibited the lowest levels of VOCs. MCL exceedances occurred at RW-3 for 1,2-dichloroethane (7.1 ug/l) and vinyl chloride (5.2 ug/l). RW-3 is an extraction well located within the limits of the waste and therefore is not in the area of attainment. The only other exceedances for Area 1 were for 1,1,2-trichloroethane at PZ-3 (23 ug/l) and at MW-5 (6.2 ug/l).

For Area 3 wells, wells RW-2 (extraction well) and new well MW-14 (monitoring well) had the highest levels of VOCs. MCL exceedances occurred at RW-2 for tetrachloroethene (15 ug/l) and trichloroethene (85. ug/l). MCL exceedances occurred at MW-14, which is downgradient of RW-2, for tetrachloroethene (9.6 ug/l), trichloroethene (5.5) ug/l) and vinyl chloride (3.7 ug/l). MCL exceedances also occurred at MW-6 for tetrachloroethene (5.3 ug/l). MW-14 is the only monitoring well to exceed MCLs off-site. However, because the ground water flow is southwestward from MW-14, contaminated ground water flows from MW-14 back on-site near MW-6.

Following the Third Quarter 1998 ground water monitoring event and subsequent to the development of the Focused RI/FS, ground water monitoring wells were again sampled as part of the routine quarterly ground water monitoring at the Old City of York Landfill Site. The results for those VOCs that exceeded MCLs are presented in the table below:

	Fourth Quarter 1998				First Quarter 1999				Second Quarter 1999			
	MW-5	PZ-3	RW-3	RW-2	MW-5	PZ-3	RW-3	RW-2	MW-5	PZ-3	RW-3	RW-2
1,2 Dichloroethane			8.7				8.5				9.1	
Methylene Chloride		12								11		
Tetrachloroethene				19				12				13
Trichloroethene				9.1				7				5.9
1,1,2 Trichloroethane	5	16				5.9				17		
Vinyl Chloride			3.4				2.5				2.7	

all concentrations are in ug/l

Drinking water MCLs were not exceeded for any VOCs in monitoring wells MW-6 and MW-14 during the Fourth Quarter 1998, First Quarter 1999, or Second Quarter 1999 monitoring events. Sampling conducted during the Third Quarter 1999 monitoring event yielded results similar to those above.

In summary, the lateral extent of the detected VOCs is very limited in area. The sampling events determined that the concentration of VOCs in ground water at the Site are at relatively low levels, with the highest levels occurring in the samples from or near the extraction wells. Overall impacts of the extraction wells on ground water flow patterns is minor.

III. Verification of Natural Attenuation

A. Introduction

The term “monitored natural attenuation” (“MNA”) refers to the reliance on natural attenuation processes (within the context of a carefully controlled and monitored site cleanup approach) to achieve site-specific remediation objectives within a timeframe that is reasonable compared to that offered by other more active methods. The “natural attenuation processes” that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or ground water. These *in-situ* processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants.

Natural attenuation processes typically occur at all sites, but to varying degrees of effectiveness depending on the types and concentrations of contaminants present and the physical, chemical, and biological characteristics of the soil and ground water. Based on the

results of the analytical and geochemical data collected and summarized in the Focused RI/FS, it is EPA's opinion that biodegradation may not be the primary mechanism of natural attenuation at the Old City of York Landfill Site. EPA believes that other physical processes, mainly dilution and dispersion, may be the leading natural attenuation processes taking place at the Site.

B. Discussion

One of the lines of evidence that can be used to assess whether natural attenuation is occurring includes the review of historical ground water data that demonstrate a clear and meaningful trend of decreasing contaminant mass and/or concentration over time at appropriate monitoring and sampling points. Based upon the review of current and historical ground water data for the Old City of York Landfill Site, it is apparent that VOC concentrations on and off the property have decreased significantly over the monitored period.

Isoconcentration maps of total VOC concentrations based on data collected in May 1996 (prior to the commencement of the pump and treat system in June 1996) and August 1998 (representing existing site conditions) were constructed (See Figures 2 and 3). The two isoconcentration maps were used to calculate the contaminant mass during these two time frames, thus allowing for an estimate of total mass removal. A comparison of these isoconcentration maps for May 1996 and August 1998 reveal that the aerial extent of the VOC plume in Area 1 has significantly decreased. The VOC plume in Area 3 appears to have stabilized in dimension. The aerial extent of the plume in Area 3 also appears to have decreased, but not as significantly as the plume in Area 1.

An estimate of the mass of dissolved VOCs was made utilizing data from May 1996 and August 1998 and isoconcentration contours developed for the contaminant plumes at the Site. The total VOC mass in the subsurface at the Site was calculated to be approximately 85 pounds in May 1996 and approximately 61 pounds in August 1998. The decrease in VOC mass of 24 pounds in 27 months equates to a removal rate of approximately 11 pounds per year. In contrast, the estimated VOC recovery rate by the pump and treat system based on recorded pumping rate and corresponding VOC concentration at each of the five extraction wells was also calculated. Based upon this calculation, the total VOC recovery by the pump and treat system in 1997 including all five extraction wells was less than one pound. The discrepancy between the observed "mass of disappearance" and "mass recovered" is likely attributable to the processes of natural attenuation.

An empirical approach was used in assessing the decline in VOC concentrations within the recovery wells in Areas 1 and 3, respectively. Historical analytical data for the recovery wells, prior to and following commencement of the pump and treat system, was reviewed and indicated that the decline in concentrations of VOCS in MW-5 and RW-3 was apparent even before the start of ground water recovery. Ground water in the Boser well and RW-1 does not contain any VOCs above the MCL. However, historic VOC concentrations in the Boser well were previously much higher with a substantial decreasing trend occurring between 1983 and 1986 (from approximately 240 ug/l to 30 ug/l total VOCs). Total VOC levels at RW-1 have been low and

FIGURE 2

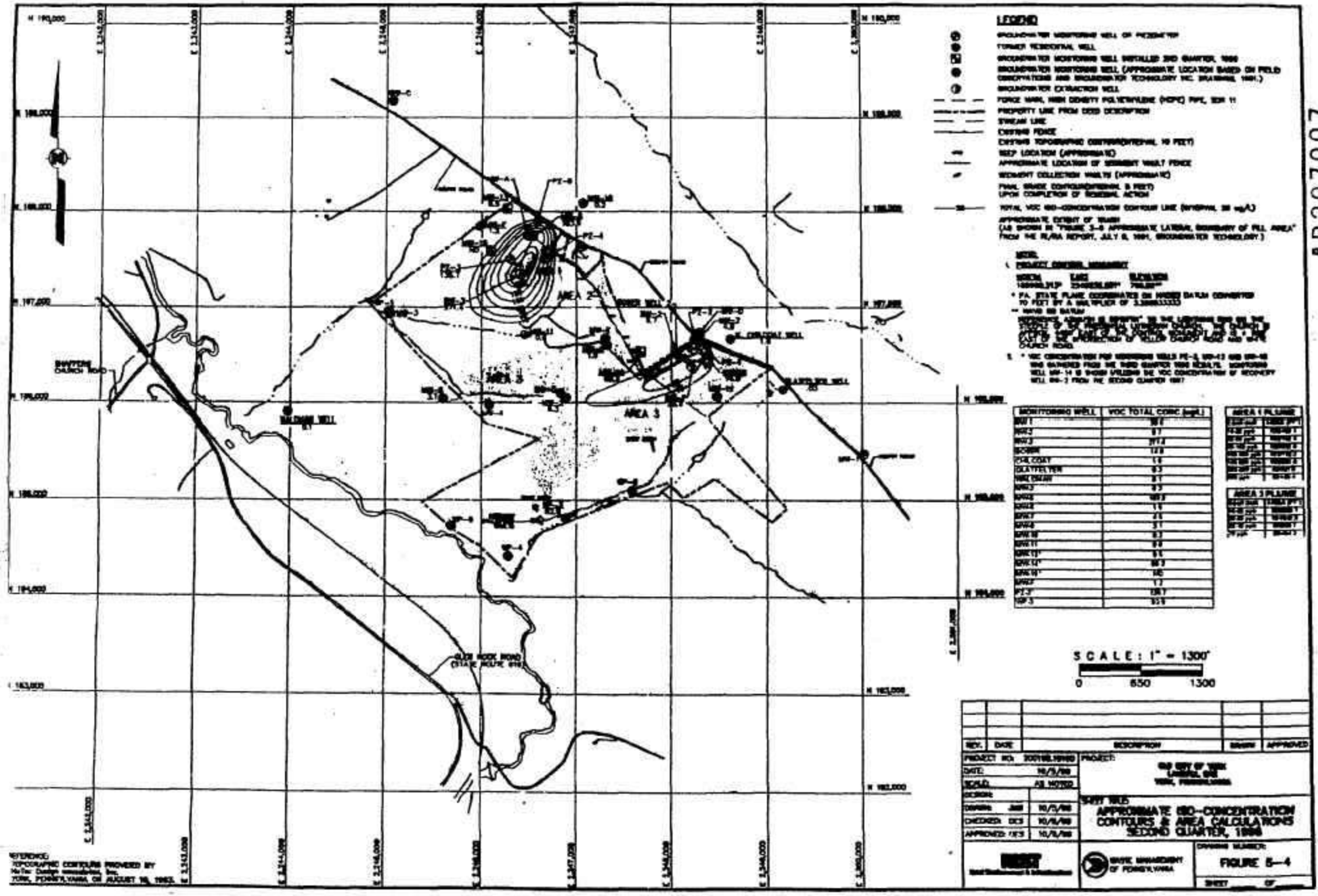
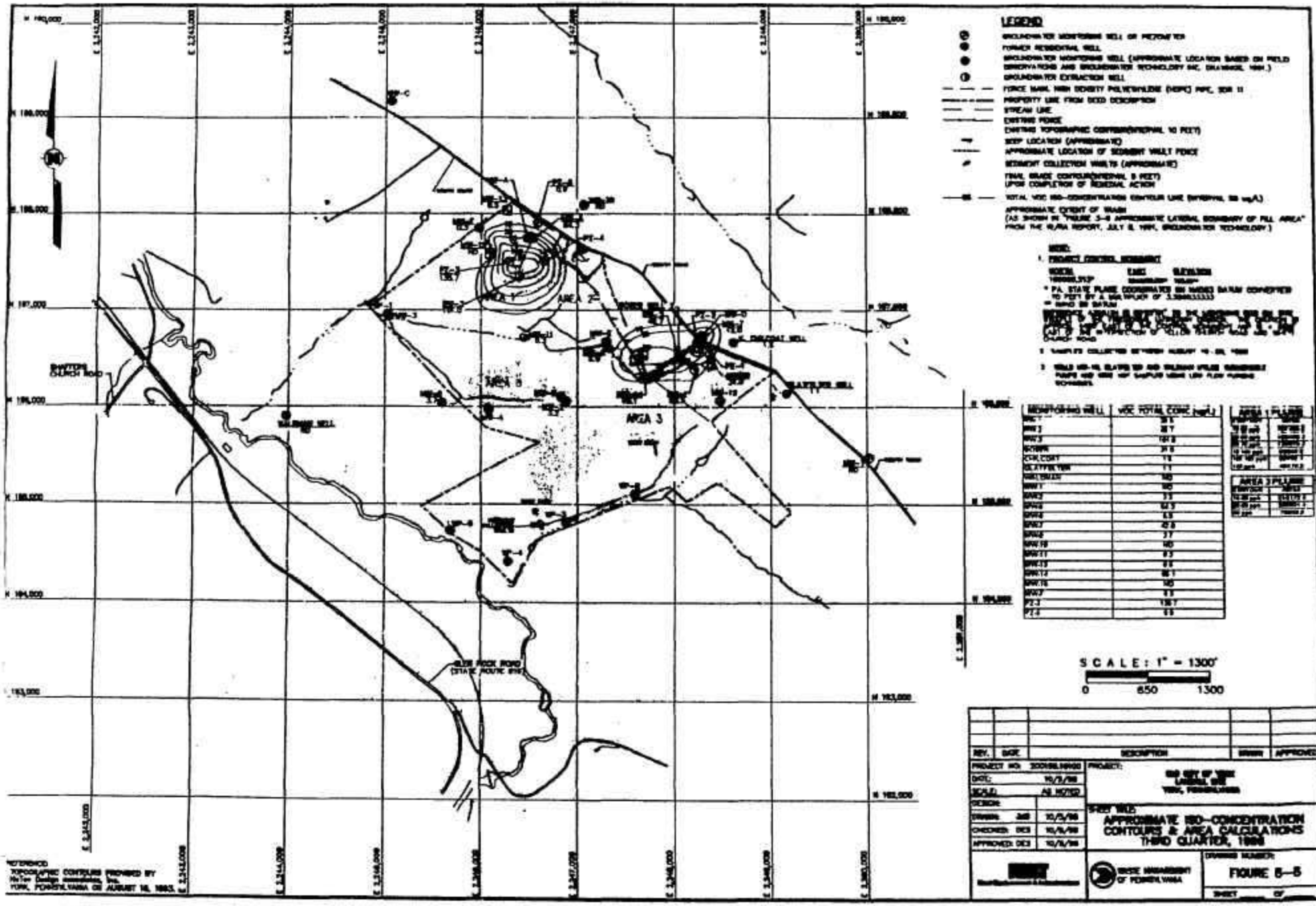


FIGURE 3


LEGEND
AREA 1
AREA 2
AREA 3
SCALE: 1" = 1300'
0
650
1300
APPROXIMATE ISO-CONCENTRATION CONTOURS & AREA CALCULATIONS THIRD QUARTER, 1998
FIGURE 5-5

fluctuate near 20 ug/l. The action of the ground water recovery system has not appeared to affect the detected concentrations in the Boser or RW-1 recovery wells. Concentrations in RW-2 appeared to be in decline before the commencement of the pump and treat system. A sudden increase in total VOC concentration was observed immediately after pumping started; it was followed by an immediate and significant decline. The sudden increase in total VOC concentration may be attributable to the induced hydraulic stress by the action of the pumping in RW-2 resulting in an influx of more contaminated water.

IV. Scope and Role of Response Actions

As discussed above, the current remedial action (ground water recovery and treatment) selected for the Site is only marginally effective. Estimates of the total VOC recovery by the pump and treat system, including all five recovery wells, indicates that less than one pound per year is being recovered compared to the loss of 11 pounds per year through natural attenuation processes. Continued operation of the existing pump and treat system adds little additional benefit toward remediation of the ground water to MCLs at the Old City of York Landfill Site.

VOC levels are overall at very low levels, particularly along the Site boundaries. The only exception is for the RW-2 and MW-14 area where MCLs are exceeded outside the Site boundaries. However, because ground water flow direction is southwestward from MW-14, the ground water from this area flows back toward the Site. Based on the very limited capture zones associated with the extraction wells, pumping of the extraction wells is not expected to significantly reduce off-property migration of VOCs.

V. Summary of Site Risks

A Risk Assessment (RA) is an analysis which estimates the potential risk to human health and the environment due to contamination of hazardous substances. It involves assessing the toxicity, or degree of hazard, posed by hazardous substances related to the Site, and describes the routes by which humans and the environment could come into contact with these substances. Separate calculations are made for substances that cause cancer (carcinogens) and for those that cause non-carcinogenic health effects.

Potential risks to human health were identified by calculating the risk level or hazard index for each chemical. Potential carcinogenic risks are identified by the risk level, and 1.0E-06 level indicates one additional chance in 1,000,000 that an individual will develop cancer. The hazard index identifies the potential for the most sensitive individuals to be adversely affected by the noncarcinogenic chemicals. If the hazard index exceeds one (1.0), there may be concern for potential noncarcinogenic effects. As a rule, the greater the value of the hazard index above 1.0, the greater the level of concern.

In calculating the risks at the Site, the exposures evaluated assume much more extensive contact with the Site contaminants than is currently occurring, or is likely to occur in the future, and as such are very conservative. As part of the original RI/FS conducted in 1991, a Baseline

RA was conducted to estimate the human health and environmental risks that would be present if contamination at the Site was not remediated. The estimated Old City of York Landfill cancer risk in the Baseline RA associated with the hypothetical use of on-site ground water as a private water supply was 1 x 10^{-3} for the combined child/adult receptor. For the combined child/adult off-site receptor using ground water, the risk was estimated to be 1 x 10^{-4}. There were no unacceptable estimates of non-cancer health effects from exposure to Site-related constituents.

However, it is important to note that currently a public water line exists at the Site and Springfield Township established a construction moratorium in the vicinity of the Old City of York Landfill Site. This moratorium is consistent with the recommendation of PADEP (1982) to the Seven Valley Borough that new homes should not be built within a certain area in and around the Site. The moratorium does not specifically preclude the installation of wells. It does provide that any housing constructed in the moratorium area be connected to the public water supply line. Springfield Township has been enforcing the moratorium since 1982 and has not issued construction permits in the moratorium area unless the landowner was connected to the public water supply. The York Water Company supplies drinking water to residents in the vicinity of the Site, thus, there is an alternative water supply to residents in the area, precluding the use of local ground water. The water is supplied via a 4-inch line which runs along South Road. There is adequate capacity in the line to supply future residents along South Road with water, should such residential development occur.

In addition to the Springfield Township construction moratorium, a restrictive covenant has been placed on the Old City of York Landfill property by the owner to limit use of that property. The covenant states in part that (a complete copy of the covenant is in the administrative record file):

> *" No wells, ponds, impoundments or other structures or facilities for the recovery of ground water or surface water shall be constructed or used to recover water from on or beneath the Property for any purpose, including home, commercial, agricultural or industrial use, irrigation, cooling, or other use."*

As stated in the 1991 ROD, the only risk of concern at the Site is through the exposure to contaminated ground water. The risks associated with exposure to contaminated ground water at the Site have not substantially changed. Actual or threatened releases of hazardous substances from this Site, if not addressed by the remedial action selected in this ROD Amendment, present a current or potential threat to public health, welfare or the environment.

DESCRIPTION OF NEW ALTERNATIVES

The Superfund process requires that the alternative chosen to cleanup a hazardous waste site meet several criteria. The alternative must protect human health and the environment, be cost-effective, and meet the requirements of environmental regulations. Permanent solutions to contamination problems should be developed whenever possible. The solutions should reduce the volume, toxicity, or mobility of the contaminants. Emphasis is also placed on treating the

wastes at the site, whenever this is possible, and on applying innovative technologies to clean up the contaminants.

The Focused RI/FS studied monitored natural attenuation ("MNA") to see if MNA was applicable for addressing the contamination at the Site. The MNA alternative was then evaluated against the existing pump and treat system alternative selected in the 1991 ROD and a "No Further Action" alternative. These alternatives are presented and discussed below. All costs and implementation timeframes specified below are estimates:

Common Elements: All of the alternatives being considered would include common components. Each alternative would include the following: (1) the restrictive covenant would remain in place and would continue to prohibit uses that would pose a public health threat, and prevent the use or development of the surface water or ground water on or beneath the Old City of York Landfill property; (2) the public drinking water pipeline installed in 1986 to service residents would remain in place for all the alternatives: (3) a long-term (30-year) ground water monitoring program to measure concentrations of site-related contaminants over time; and (4) an EPA review of the Site every five years to ensure continued protection to human health and the environment for each of the alternatives.

Alternative 1: No Further Action

Capital Cost:	$0
Operation and Maintenance:	$160,699
Present Worth:	$739,710
Months to Implement:	0

The National Contingency Plan ("NCP"), EPA's regulations governing the Superfund program, requires that EPA consider a "No-Action" alternative at every site to establish a baseline for comparison with other alternatives that require action. Under this alternative, no remedial action would be taken at the Site. Since remedial actions have already been taken at the Site, a true "no-action" is not possible. The best approximation of a no-action alternative is ceasing current actions, that is removing the restrictive covenant for the Site and shutting off the public water supply. However, since these remedial actions will not cease, this alternative has been termed "no further action".

In this alternative, the public water line will remain in service and the restrictive covenant on the Old City of York Landfill property that is part of EPA's earlier ROD would continue to prohibit uses that would pose a public health threat, and prevent the use or development of the surface water or ground water on or beneath the property. The Site would be left in its current condition. A long-term (30-year) ground water monitoring program would be implemented at the Site using the existing wells. EPA would review the Site every five years in accordance with the requirements of CERCLA to assure continued protection to human health and the environment.

Alternative 2: Continue existing ground water recovery and treatment system in refuse Area #3 and Area #1, restore soil cover at refuse Area #3 (northeastern portion), ground water monitoring, vault sediment removal with off-site disposal

Capital Cost:	Not Applicable
Operation and Maintenance:	$223,644
Present Worth:	$2,050,061
Months to Implement:	Not Applicable

This alternative was selected as the remedial alternative in the 1991 ROD and has already been constructed and implemented. This alternative consisted of the restoration of the soil cover in the northeastern portion of refuse Area 3 to a two foot minimum, ground water recovery/treatment system in both Areas 1 and 3, a landfill gas extraction system, removal of contaminated sediments from on-site concrete leachate collection vaults, and a ground water monitoring program. In addition, this alternative included a perimeter fence at the leachate collection vaults to prevent public access, and a surface water/sediment monitoring program for the leachate seeps and tributaries on-site to ensure continued protection to human health and the environment.

Alternative 3: Monitored Natural Attenuation with Institutional Controls in both Area 1 and Area 3

Capital Cost:	Not Applicable
Operation and Maintenance:	$200,755
Present Worth:	$1,538,049
Months to Implement:	Not Applicable

For this alternative, a long-term monitoring program would be required to verify that natural attenuation will meet the remedial standards of achieving MCLs in ground water (i.e., that VOC levels are decreasing as anticipated as a result of natural attenuation) and to trigger a contingent remedy to restart the existing pump and treat system remedy in the event that the monitoring results reveal that the plume is significantly expanding or natural attenuation processes are not protective of human health and the environment. Should a contingent remedy be triggered, an ESD or ROD Amendment would be required. The monitoring program will consist of 30 years of quarterly sampling with potentially reduced frequency for some or all of the monitoring wells to semiannual or annual thereafter based upon statistical evaluation of the first 8 quarters of data. In the event that the statistical evaluation of the first two years of data indicate that natural attenuation processes continue to reduce the plume with no evidence of migration of VOCs, EPA may reduce the sampling frequency to semi-annual or annual.

The statistical analysis method and approach will be outlined in the Operation and Maintenance ("O&M") Plan for the Site. The exact wells which will be utilized to monitor the natural attenuation processes will be determined in the operation and maintenance ("O&M")

plan. Following the statistical evaluation of ground water data, if the data indicates that the plume has significantly expanded and VOCs migrate off-property at levels that are not protective of human health or the environment, or natural attenuation processes are not protective to human health and the environment, a contingency measure, including restarting the existing pump and treat system, will be implemented.

To reduce the potential for human exposure to ground water contamination due to the Site, institutional controls (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) shall be established. Specifically, the institutional controls would include ground water extraction controls implemented on individual properties, as necessary, to prohibit or restrict ground water use within the immediate Site vicinity in order to prevent migration of the existing plume. Also, the implementation of institutional controls may also prohibit the installation of any new wells, as necessary, to ensure that contaminated ground water is not inadvertently drawn off the property boundary and contaminate previously uncontaminated areas. An evaluation of York County and Springfield Township long-term plans will be evaluated for the area, and ground water modeling will be conducted to determine which, if any, properties will require the aforementioned institutional controls (Figure 4 presents a conceptual schematic of those residential properties which may require these institutional controls).

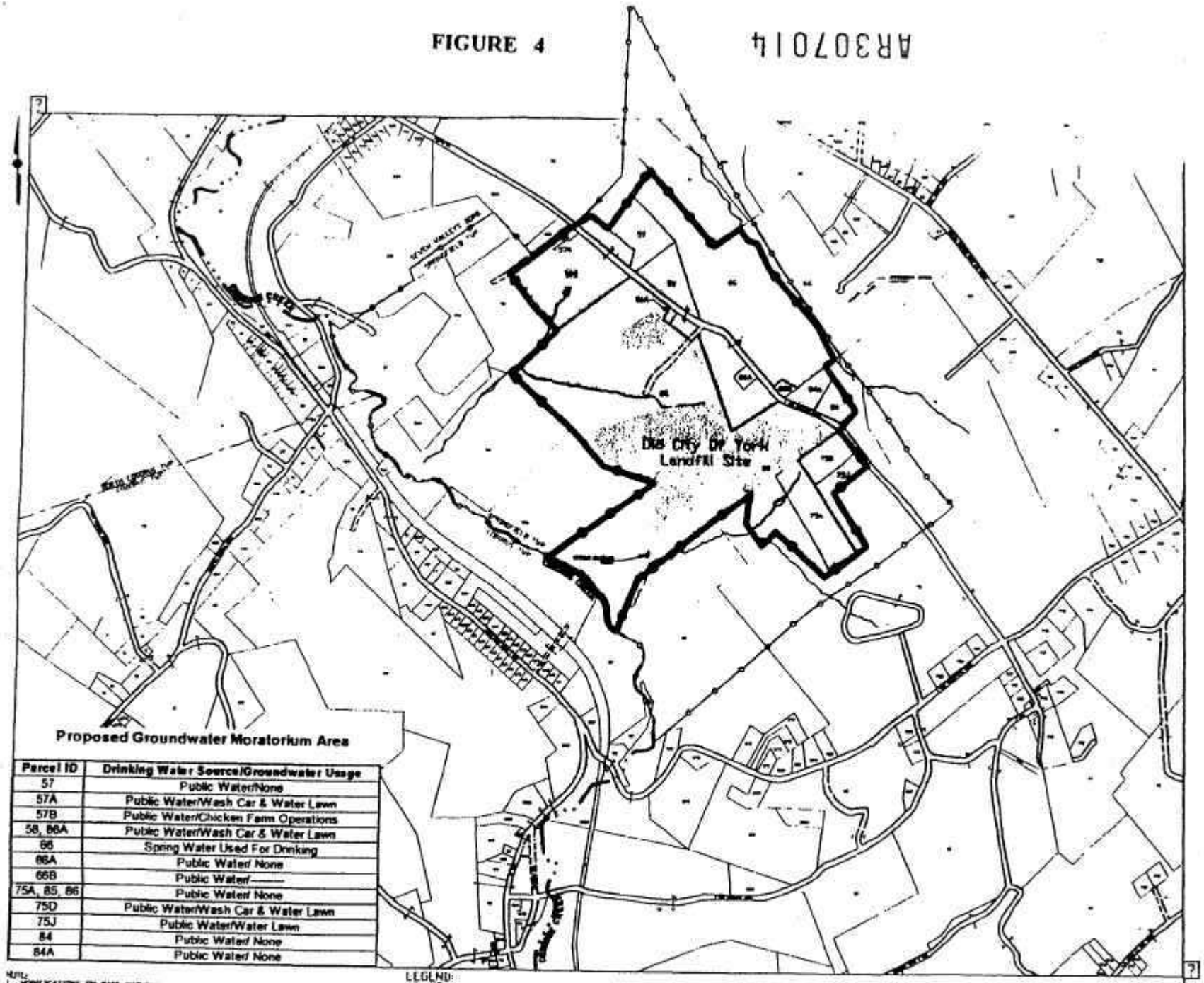
EVALUATION OF ALTERNATIVES

A detailed analysis was performed on the alternatives using the nine evaluation criteria specified in the NCP in order to select a remedy. The following is a summary of the comparison of each alternatives' strength and weaknesses with respect to the nine evaluation criteria. These nine evaluation criteria are listed and described in Exhibit A.

A. Overall Protection of Human Health and the Environment

Alternative 1 (No Further Action) would be least protective of human health and the environment since this alternative does not actively address reducing or controlling contamination at the Site. Both Alternatives 2 and 3 are considered protective of human health and the environment. Alternative 2 would reduce the risk to human health from exposure to contaminated ground water through ground water recovery and treatment. Alternative 3 would eliminate/decrease the existing ground water contamination through natural attenuation processes. Ground water is not utilized for drinking water purposes on the Site and a restrictive covenant on the Boser property prohibits future use of the ground water for drinking water and other purposes. Also under Alternative 3, to reduce the potential for human exposure to contamination due to the Site, institutional controls (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) shall be implemented on individual properties, as necessary, to prohibit or restrict ground water use from existing ground water wells within the immediate Site vicinity in order to prevent migration of the existing plume. The institutional controls may also prohibit the installation of any new ground water wells, as necessary, to ensure that contaminated ground water is not inadvertently drawn off the property boundary resulting in contamination of previously uncontaminated areas.

FIGURE 4



Parcel ID	Drinking Water Source/Groundwater Usage
57	Public Water/None
57A	Public Water/Wash Car & Water Lawn
57B	Public Water/Chicken Farm Operations
58, 86A	Public Water/Wash Car & Water Lawn
66	Spring Water Used For Drinking
66A	Public Water/ None
66B	Public Water/———
75A, 85, 86	Public Water/ None
75D	Public Water/Wash Car & Water Lawn
75J	Public Water/Water Lawn
84	Public Water/ None
84A	Public Water/ None

NOTE:
1. [illegible]
2. [illegible]

REFERENCE:
[illegible]

LEGEND:
[illegible]

WASTE MANAGEMENT OF PA
OLD CITY OF YORK LANDFILL SITE
YORK COUNTY, PENNSYLVANIA
PROPOSED GROUNDWATER USAGE MORATORIUM AREA

FIGURE 64

EXHIBIT A

ALTERNATIVE EVALUATION CRITERIA

Overall Protection of Human Health and the Environment - Addresses whether the remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment engineering controls or institutional controls.

Compliance with ARARs - Refers to whether or not a remedy will meet all Applicable or Relevant and Appropriate Requirements (ARARs) of federal and state environmental statues and/or provides grounds for invoking a waiver.

Long-Term Effectiveness and Permanence - The ability of the remedy to maintain reliable protection of human health and the environment over time once the "clean-up" goals have been met.

Reduction of Toxicity, Mobility or Volume Through Treatment - Relates to the anticipated performance of the treatment technologies with respect to these criteria.

Short-Term Effectiveness - Refers to the period of time needed to achieve protection, and any adverse impacts on human health and the environment that may be posed during the construction and implementation, until "clean-up" goals are achieved.

Implementability - The technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

Cost - The following costs are evaluated: estimated capital, operation and maintenance, and net present worth.

State Acceptance - This indicates whether, based on its review of the Feasibility Study and the Proposed Plan, the State concurs with, opposes, or has no comment regarding the preferred alternative.

Community Acceptance - Will be assessed in the Record of Decision following a review of the public comments received on the Administrative Record and the Proposed Plan.

VOC levels are overall at very low levels, particularly along the Site boundaries. The only exception is for the RW-2 and MW-14 area where MCLs are exceeded outside the Site boundaries. However, because ground water flow direction is southwestward from MW-14, the ground water from this area flows back toward the Site. Based on the very limited capture zones associated with the extraction wells already in place under Alternative 2, pumping of the extraction wells is not expected to significantly reduce migration of VOC.

B. Compliance with ARARS

Any cleanup alternative EPA considers must comply with all applicable or relevant and appropriate federal and state environmental requirements ("ARARs"). *Applicable* requirements are those substantive environmental standards, requirements, criteria, or limitations promulgated under federal or state law that are legally applicable to the remedial action to be implemented at the Site. *Relevant* and *Appropriate* requirements, while not being directly applicable, address problems or situations sufficiently similar to those encountered at the Site that their use is well suited to the particular Site.

The current ARAR for ground water consists of achieving drinking water maximum contaminant levels ("MCLs") in the area of attainment for the VOCs identified in Table 29 of the existing ROD (Table 1 of this ROD Amendment). Those VOCs are the contaminants of concern ("COC"). MCLs are promulgated under the Safe Drinking Water Act, 42 U.S.C. §§ 300 f to 300 j-26, and its implementing regulations at 40 C.F.R. Part 141.61 (the original ARAR in the ROD was Pennsylvania's "background" levels for those parameters listed in Table 29 of the 1991 ROD; however, on September 27, 1996, EPA issued an Explanation of Significant Differences ("ESD") which changed the ARAR to MCLs.). The ARARs in the present ROD are those set forth at 40 C.F.R. Part 141.61 for those contaminants listed in Table 1 of this ROD Amendment. PADEP has identified the Land Recycling and Environmental Remediation Standards Act (Act 2), and its implementing regulations at 25 PA Code Chapter 250, Administration of the Land Recycling Program, as ARARs for this remedy. EPA has determined that Act 2 does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the federal standard.

After approximately 3 years of operation of the ground water pump and treat system under Alternative 2, this ARAR has not been achieved. Overall, exceedances of MCLs in the area of attainment are limited to a few wells. An evaluation of historic trends of VOC levels in key wells, indicates that ground water pump and treat has not significantly affected trends (i.e., resulted in decreasing VOC levels).

Based on existing results and the limited capture zones achievable because of the low yielding anisotropic nature of the aquifer, ground water extraction and treatment is not considered to be more likely to achieve MCLs than Alternative 3. Alternative 3, Monitored Natural Attenuation, is capable of achieving MCLs in ground water virtually within the same time period as Alternative 2. As stated previously, active pump and treat removes approximately only an additional pound of VOCS compared to the 11 pounds lost through natural attenuation processes.

TABLE 1[1]

REQUIRED REMEDIATION LEVELS FOR GROUND WATER

COMPOUND[2]	REQUIRED CONCENTRATION (UG/L)	
	VALUE	BASIS
BENZENE	5	MCL
1,4-DICHLOROBENZENE	75	MCL
1,2-DICHLOROETHANE	5	MCL
1,1-DICHLOROETHENE	7	MCL
METHYLENE CHLORIDE	5	MCL
TETRACHLOROETHENE	5	MCL
1,1,2-TRICHLOROETHANE	5	MCL
TRICHLOROETHENE	5	MCL
VINYL CHLORIDE	2	MCL

NOTES

(1) Based, in part, on Table 29 of the Record of Decision dated September 30, 1991. Original Table 29 MCL value for methylene chloride has been revised.

(2) Includes all chemicals evaluated for ground-water exposure risks at the Old City of York Landfill Site.

The "No Further Action" alternative would not meet ARARs. Furthermore, since Alternative 1, No Further Action, does not meet the threshold criteria of overall protection of human health and the environment and compliance with ARARs, it will not be considered further in this analysis.

C. Long-term Effectiveness and Permanence

Both Alternatives 2 and 3 would provide essentially equal levels of long-term effectiveness and permanence by reducing the concentrations of contaminants in ground water. The difference between the alternatives with regard to the long-term effectiveness and permanence is directly related to how each alternative addresses ground water contamination at the Site (i.e., active ground water extraction and treatment, Alternative 2, or monitored natural attenuation, Alternative 3). Alternative 2 has the potential to meet MCLs marginally faster than Alternative 3 because it is an active cleanup process. The cleanup time for ground water, however, is not crucial, because a water line exists at the Site, and the existing and proposed ground water extraction controls will prevent further contact with contaminated ground water.

During and upon completion of Alternative 2, ground water extraction and treatment, residual waste in the form of carbon from the stripper off-gas treatment and sediment in the bottom of the equalization tank would need to be managed. Such residual waste will not need to be managed for Alternative 3.

For each alternative, ground water monitoring would be conducted to identify progress in achieving remediation standards and after remediation standards have been achieved to ensure the permanence of the selected alternative.

D. Reduction of Toxicity, Mobility or Volume through Treatment

Alternative 2 would not reduce the toxicity of the contaminants in the aquifer but would affect their mobility near the wells through hydraulic containment and slightly decreased contaminant volume through extraction. However, the mass removal of VOCs achieved by the extraction wells to date is extremely low typically ranging from approximately 0.003 pounds per quarter for RW-1 to approximately 0.2 pounds per quarter for RW-3.

Alternative 3 relies on the processes of natural attenuation to reduce the mobility of the contaminants present in the ground water. To monitor the rate of natural attenuation and the fate of the contaminants, Alternative 3 will utilize the results of ground water sampling and analysis, which was conducted at the Site to specifically investigate natural attenuation processes. The volume of the contamination will also be reduced by the natural attenuation processes.

E. Short-term Effectiveness

The ground water extraction and treatment system under Alternative 2 has been in operation

since June 1996. Because the system already exists, human health and environmental risks related to its construction are not relevant. However, minimal worker risks associated with routine operation and maintenance of the system may occur.

For monitored natural attenuation, Alternative 3, there are acceptable risks associated with its implementation because of the very low level of contaminants. Worker risks associated with monitoring well sampling may occur but are expected to be minimal based upon level of contamination and duration of activity. Based on ground water flow patterns, the distribution of VOCs in ground water and their low levels, the potential for further migration of contamination outside the Site property while natural attenuation proceeds is minimal.

F. Implementability

Alternative 2, ground water extraction and treatment, is already constructed and operating, therefore implementability issues associated with its construction are not pertinent. In terms of operation, the system has proven dependable to date. Since the ground water treatment system is based on proven technologies, no significant technical difficulties are anticipated with its ongoing operation.

Alternative 3, monitored natural attenuation with institutional control remedy would not require any construction. As discussed previously, the restrictive covenant is already in place for the landfill property itself. Any institutional controls restricting ground water use within the Site vicinity necessary to prevent the migration of the existing plume and reduce the potential for human exposure to contamination are expected to be obtainable. Alternative 3 would require a ground water monitoring well network which is already in place.

G. Cost

A comparison of capital costs for Alternative 2 and Alternative 3 is not relevant because the ground water extraction and treatment system is already constructed and no new construction is required for the monitored natural attenuation with institutional control remedy. Therefore, this evaluation considers only estimated O&M and monitoring costs from 1999 through the anticipated end of remedial action in 2025.

The total net present worth (“NPW”) cost for Alternative 2 is $2,050,061. The NPW cost for Alternative 3 is $1,538,049. The NPW costs for both alternatives are approximations. Detailed cost breakdowns for each of the alternatives are available in the Administrative Record.

H. State Acceptance

The Commonwealth of Pennsylvania has concurred with the selected remedy described in this ROD Amendment.

I. Community Acceptance

EPA has considered the comments received during the public comment period on its preferred remedial alternative presented in the Proposed Plan. These comments are summarized and responses are provided in the Responsiveness Summary portion of this ROD Amendment.

DESCRIPTION OF THE SELECTED REMEDY

Based upon consideration of the information available for the Old City of York Landfill Site, including the documents available in the administrative record file, an evaluation of the risks currently posed by the Site, the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has selected Alternative 3, Monitored Natural Attenuation with Institutional Controls in both Area 1 and Area 3, as the revised selected remedy for the Old City of York Landfill Site.

For this alternative, a long-term monitoring program would be required to verify that natural attenuation will meet the remedial standards of achieving MCLs in ground water (i.e., that VOC levels are decreasing as anticipated as a result of natural attenuation) and to trigger a contingent remedy to restart the existing pump and treat system remedy in the event that the monitoring results reveal that the plume is significantly expanding or natural attenuation processes are not protective of human health and the environment. Should a contingent remedy be triggered, an ESD or ROD Amendment would be required. Alternative 3 meets the threshold criteria of overall protection of human health and the environment and compliance with ARARs. In considering the balancing criteria, EPA believes Alternative 3 is easily implemented, achieves long-term effectiveness and permanence at a reasonable cost, minimizes the short-term impacts, and effectively reduces the mobility of Site contaminants.

Furthermore, concentrations of contaminants in ground water are at low levels. The alternate remedy selected in this ROD Amendment will not require the contaminated ground water to be actively remediated through the existing pump and treat system. Instead, the remediation of the aquifer to MCLs will be allowed to take place through natural attenuation processes.

The requirements for implementing Alternative 3 are as follows:

A. Natural Attenuation Requirements

(1) Natural attenuation processes shall be allowed to reduce the concentrations of VOC contaminants in the ground water at the Site to levels that protect human health and the environment. EPA has determined that the appropriate cleanup levels for the contaminants in the ground water shall be drinking water maximum contaminant levels (“MCLs”) as referenced in Table 29 of the 1991 ROD with one modification. The cleanup level referenced for methylene chloride in Table 29 of the 1991 ROD is 11 ug/l. This cleanup level for methylene chloride is a risk-based remediation level as established in the original RI/FS. Since the issuance of the 1991 ROD, EPA has established an MCL

of 5 ug/l for methylene chloride. (Table 1 of this ROD Amendment reiterates the appropriate VOC cleanup levels with the methylene chloride modification).

(2) A statistical evaluation of the monitoring data shall be performed every two years, unless EPA determines that more frequent analysis is required, to determine the rate at which natural attenuation processes are reducing VOC levels at this Site.

B. Monitoring Requirements

(1) Monitoring shall be performed to measure changes in contaminant concentrations in the ground water plume at the Site until the cleanup levels have been achieved. The exact location and number of ground water monitoring points shall be determined by EPA, in consultation with PADEP, during the preparation of the Operation and Maintenance Plan for the Old City of York Landfill Site.

(2) Samples shall be collected from the monitoring points on a quarterly basis for up to 30 years. Samples shall be collected and analyzed for VOCs.

(3) If EPA determines that a statistical evaluation of the ground water data collected for the first eight quarters of the monitoring program demonstrates that natural attenuation processes are reducing the contaminant concentration at a reasonable rate and that the contaminants are not significantly migrating, EPA may reduce the frequency of sample collection and may limit the scope of analysis required. In the event that the statistical evaluation of the first two years of data indicate that natural attenuation processes continue to reduce the plume with no evidence of migration of VOCs, EPA may reduce the sampling frequency to semi-annual or annual. If EPA determines that contaminant levels are not decreasing at a reasonable rate or that significant contaminant migration is occurring, EPA may increase the frequency of sample collection, may require additional analysis, or trigger the contingent remedy to restart the pump and treat system. Should the contingent remedy be triggered, an ESD or ROD Amendment would be required.

C. Institutional Controls

(1) Institutional controls (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) shall be implemented on individual properties, as necessary, to prohibit or restrict ground water extraction from existing ground water wells within the immediate Site vicinity in order to prevent migration of the existing plume. The institutional controls may also prohibit the installation of any new wells, as necessary, to ensure that contaminated ground water is not inadvertently drawn off the property boundary and resulting in contamination of previously uncontaminated areas. An evaluation of York County and Springfield Township long-term plans will be evaluated for the area and ground water modeling will be conducted to determine which, if any, properties will require the aforementioned institutional controls.

(2) The Restrictive Covenant that is currently in place on the landfill property shall remain in effect.

STATUTORY DETERMINATIONS

This remedy satisfies the remedy selection requirements of CERCLA and the NCP. The remedy is expected to be protective of human health and the environment, complies with ARARs, is cost effective, and utilizes permanent solutions. The remedy does not include treatment as a principal element of the remedy because natural attenuation processes can reduce contaminant concentrations to levels that protect human health and the environment within a reasonable time frame. Additionally, once the institutional controls are implemented there will be no risk of direct exposure to the Site-related contaminants. The following is a discussion of how the selected remedial action addresses the statutory requirements.

A. Overall Protection of Human Health and the Environment

The selected remedy will provide adequate protection of human health and the environment by allowing natural attenuation processes to reduce the contamination in the ground water. This action will reduce the carcinogenic risk from exposure to contaminated ground water through the implementation of institutional controls.

B. Compliance with Applicable or Relevant and Appropriate Requirements ("ARARS")

The selected remedy will comply with the Safe Drinking Water Act, 42 U.S.C. §§ 300 f to 300 j-26, and its implementing regulations at 40 C.F.R. Part 141.61 with respect to meeting drinking water MCLs. PADEP has identified Act 2 as an ARAR for this remedy; EPA has determined that Act 2 does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the federal standard.

C. Cost Effectiveness

EPA has determined that the selected remedy most effectively addresses contaminated ground water while minimizing costs. The estimated present worth cost is $1,538,049. The existing ground water extraction system, while not significantly more expensive, only provides marginal additional benefit toward remediation of ground water to MCLs at the Site.

D. Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a cost-effective manner at the Site. The selected remedy does not require treatment because the current remedy

(ground water extraction and treatment) achieves only marginal additional protection for additional cost

E. Preference for Treatment as a Principal Element

As stated above, the selected remedy does not require treatment because the current remedy (ground water extraction and treatment) achieves only marginal additional protection for approximately $500,000 in additional costs.

RESPONSIVENESS SUMMARY
OLD CITY OF YORK LANDFILL SITE
SPRINGFIELD TOWNSHIP, PENNSYLVANIA

This community relations responsiveness summary is divided into the following sections:

SECTION I: Overview: This section discusses EPA's selected remedy for the Old City of York Landfill Site.

SECTION II: Background: This section provides a brief history of community interest and concerns raised during remedial response at the Old City of York Landfill Site.

SECTION III: Summary of Commentors' Major Issues and Concerns: This section provides a summary of commentors' major issues and concerns, and expressly acknowledges and responds to those raised by the local community. "Local community" may include local homeowners, businesses, the municipality, and not infrequently, potentially responsible parties (PRPs).

I. OVERVIEW

In September 1999, EPA announced the public comment period and published its preferred alternative for the Old City of York Landfill Site, located in Springfield Township, York County, Pennsylvania. EPA screened three possible alternatives for the continued remediation of site contamination. EPA carefully considered state and community acceptance prior to reaching its final decision regarding amending the current remedy. The Agency's revised remedy is Monitored Natural Attenuation with Institutional Controls in both Area 1 and Area 3. This alternative satisfies the key criteria for remedy selection and minimizes the need for long-term treatment and management.

II. BACKGROUND

Community interest and concern about the Site has been steady throughout EPA involvement. To obtain public input on the Proposed Remedial Action Plan (Proposed Plan or PRAP), EPA held a public comment period from September 10, 1999 to October 12, 1999. EPA also held a public meeting on September 21, 1999. Those in attendance at the meeting included local area residents, state officials, news media representatives, representatives from EPA, and representatives from companies interested in the Site activities and cleanup decisions.

Public notification of the September 21, 1999 meeting was issued to local media and to area

residents and Federal, state, and local officials on EPA's Site mailing list. EPA announced the opening of the public comment period in a newspaper display ad placed in the September 10, 1999 edition of the *York Daily Record* and *Hanover Evening Sun*.

In addition, EPA established a Site information repository at the Village Library in Jacobus, Penn sylvania. The repository contains the Community Relations Plan, the Focused RI/FS Report, the PRAP, and EPA's Administrative Record File for the Site, which encompasses the key documents the Agency uses in selecting the Site remedy.

III. SUMMARY OF COMMENTORS' MAJOR ISSUES AND CONCERNS

This section provides a summary of commentors' major issues and concerns, and expressly acknowledges and responds to those raised by the local community. The major issues and concerns on the proposed remedy for the Old City of York Landfill Site received at the public meeting on September 21, 1999, and during the public comment period, can be grouped into the following categories:

A. Comments Submitted by the Local Community
B. Comments Submitted by Springfield Township
C. Comments Submitted by Potentially Responsible Parties
D. Comments Submitted by the Commonwealth of Pennsylvania

The questions, comments, and responses are summarized as follows:

A. Comments Submitted by the Local Community

1. A local resident raised concerns regarding local residents' ability to eventually sell their homes adjacent to the Old City of York Landfill Site and if EPA would provide any financial assistance should property values be decreased because of the presence of the landfill.

   EPA Response: Unfortunately, EPA cannot provide any financial assistance to homeowners to compensate them for decreased property values as a result of the presence of the landfill. EPA may consider paying damages to residents only if an adjacent homeowners uncontaminated property would be unavoidably and directly impacted by the remedial activities taking place during a cleanup of a Superfund Site. This was not the case at the Old City of York Landfill Site since all construction activities occurred within the Site boundary.

2. A couple of months ago we had a meeting in Springfield Township where you had wanted us to put these restrictions on. Has that now fallen by the wayside?

   EPA Response: On July 8, 1999 EPA and Waste Management, Inc. ("WMI") met with local residents to discuss the proposed changes to the remedy that were being

contemplated. This was done in advance of issuing the Proposed Remedial Action Plan to get a sense of local community reaction to establishing institutional controls on individual properties within the vicinity of the Old City of York Landfill Site. Although one or two residents voiced objections, EPA believed the majority of the residents were not opposed.

3. Everyone can agree that the volatile organic compounds (VOCs) found in the landfill can be cancer causing at very low levels. This was poorly discussed in the Proposed Plan. The "Summary of Site Risks" is limited to the risk of drinking the ground water. There are other pathways for the chemicals to enter our bodies.

   EPA Response: The risks associated with VOCs at the Site were not discussed in detail in the Proposed Plan because they were discussed in detail in the "*Final Revised Remedial Investigation and Risk Assessment Report*" dated July 8, 1991, and the original Record of Decision (ROD) dated September 30,1991. In EPA's opinion, the baseline risks at the Site have not substantially changed. Based on the baseline risk assessment, the individual exposure pathway associated with the largest, theoretical, upper-bound, incremental cancer risk was exposure to on-site ground water. Exposure to on-site ground water included the following exposure pathways: (1) inhalation of vapor during showering; (2) dermal contact with ground water during showering; and (3) ingestion of ground water. In addition to exposure to ground water, dermal contact and incidental ingestion of surface soil, and inhalation of dust were also evaluated. The latter exposure pathways were determined not to pose an unacceptable risk.

4. We, as humans, come into contact with a lot of chemicals (i.e., in the water, the air, on the land [60 million birds die each year in the U.S. from insecticide poisoning] and in the food we consume) that are detrimental to our health. All of these may be at low levels but the cumulative affect is not discussed.

   EPA Response: The purpose of the baseline risk assessment is to assess the incremental cancer risk a person may be subject to from exposure to Site-related contaminants assuming no further action is taken to address the contamination. it would be extremely difficult to assess the cumulative affects associated with exposure to contaminants at a Superfund Site and exposure to other contaminants associated with everyday daily activities. Such an evaluation would be different for every individual dependent upon occupation, lifestyle, etc., and be subject to many uncertainties. In order to develop a strategy to assess risks posed by contaminants at Superfund sites standardized methodologies are used to calculate cumulative risks for different exposure pathways and site-specific chemicals associated with the Site. These pathways are then combined to determine what the cumulative risk may be to an individual.

5. Any reduction in the amount of our exposure to harmful chemicals is warranted. Alternative 2 is the only alternative that physically removes the hazardous materials. It is for this reason that I support Alternative 2 over Alternative 3.

EPA Response: The current remedy, ground water extraction and treatment, does remove contaminants from the aquifer. However, since the concentration of contaminants in the aquifer are so low, it does not do so efficiently. As discussed in the ROD Amendment, natural attenuation processes appear to be much more effective in reducing contamination at the Site with an equal ability to achieve the eventual cleanup of the ground water to drinking water maximum contaminant levels (MCLs). Continued operation of the existing pump and treat system is not practical for such a marginal return in benefit.

6. What is EPA's position on technologies that use bacteria to cleanup ground water pollution. (an article about the use of bacteria in Australia to cleanup ground water was enclosed).

EPA Response: Bioremediation of ground water can be an effective remedy for certain sites. Typically, one of the primary factors of natural attenuation, such as the remedy EPA is selecting in this ROD Amendment, is the biodegradation of contaminants with naturally occurring bacteria found in the subsurface soils. Unfortunately, at the Old City of York Landfill Site, the conditions are not entirely conducive for biodegradation to be the primary natural attenuation process occurring at the Site. Rather, EPA believes that dilution and dispersion are the primary natural attention processes at work at the Site.

7. The term "cost-effective" is a great tool of management/accounting and it is a scary one. It makes you wonder whether Congress withheld funds for use for one of their pork barrel projects or did the lobbyists win - Waste Management being one.

EPA Response: EPA is mandated by the Superfund process to consider the cost-effectiveness of all Superfund remedies. Cost-effectiveness is determined by evaluating the following three of the five balancing criteria during the evaluation of the nine criteria as presented in Exhibit A of the ROD Amendment: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; and short-term effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost-effective. A remedy is cost effective if its costs are proportional to its overall effectiveness. Cost-effectiveness is concerned with the reasonableness of the relationship between the effectiveness afforded by each alternative and its costs compared to other available options.

8. The EPA doesn't really believe that there are only twelve pounds of contaminants in the site per year, does it? What about all the contaminants that were dumped there since 1961? Where did they go? Does EPA know the relationship between the water passing through the Site and its effect on the aquifer? What proof does EPA have that quantities of carcinogens aren't passing into the aquifer? How deep is the aquifer? How many test wells were made on the 56 plus acres in order to gather data for cost analysis? A couple? How deep are the wells, 25 feet or so? Have you sought any independent advice on this? I would guess not. I find it hard to believe that the landfill is clean even though it was on the Superfund List - of which the lawyers got most of the money.

EPA Response: The Old City of York Landfill Site has been studied for approximately the past twenty years. This includes study by the PRPs and their consultants, PADEP, technical experts at EPA, and independent contractors hired by EPA. The relationship between the landfill and the aquifer is well established. There are a total of 34 wells on and off the landfill property that have been monitored during the Site's history not including a substantial number of residential wells in the Site area. The wells range in depth from 15 feet to 250 feet in depth. This information is contained in the "*Final Revised Remedial Investigation and Risk Assessment Report"* dated July 8, 1991, and several other technical documents that were subsequently developed and which are contained in the administrative record file.

EPA has never said the Old City of York Landfill Site is clean. Obviously, the presence of VOCs above their respective MCLs is an indication that the Site is not clean. The estimation that 12 pounds of VOCs are being removed per year through natural attenuation process is just that, an estimation. This estimation is based upon knowledge of the aquifer characteristics and monitoring data from wells at the Site. The point that EPA is trying to make is that three years of operation of the pump and treat system reveals that the system is only marginally effective and provides little additional benefit to the eventual cleanup of this Site over the natural processes currently taking place in the aquifer itself.

B. Comments Submited by Springfield Township

General Comment

The comments are based on review of the document entitled *"Alternative Ground water Remedy Evaluation Report"* (the **"Report"**) dated November 1998 prepared by RUST Environment & Infrastructure on behalf of Waste Management; Inc. ("WMI"), review of the public record for the Site, evaluation of past monitoring data, and discussions with representatives of the Environmental, Protection Agency Region III ("EPA") and WMI. The Township does not support WMI's alternative plan at this time.

The Township does not believe that WMI has shown that natural attenuation is capable of achieving remediation goals at the Site.

The Township voices strong opposition to any plan that includes removal of the existing ground water recovery system. The Township fears tear-down of the ground water recovery system would remove an important safety option that may be needed for the protection of Township residents.

The Township feels the alternative plan requires institutional controls that are too strict and could trigger takings claims which the Township could be forced to defend.

Therefore the Township **voices** strong opposition to any plan that includes Township enforced zoning ordinances as an institutional control.

The Township voices strong opposition to any plan that abandons clean wells and useable land as an end goal of remediation.

The Township has reviewed the most recent monitoring results and feels the results are consistent with the views expressed in these comments.

EPA Response: EPA acknowledges and has considered the above statements made by the Township. The Township's specific comments are addressed by EPA below.

Comments to "Alternative Ground Water Remedy Evaluation Reports"

1. Monitoring, extraction, and residential wells are spread throughout the Site providing adequate monitoring data. The Township questions the lack of monitoring wells ("MW") between the northeast of Area 3 and the past and west seeps since this is the steepest gradient and likely the strongest flowpath for ground water.

   EPA Response: The area between the northeast section of Area 3 and the east and west seeps consists mostly of landfilled areas. Ground water cleanup efforts are focused on ground water quality outside the waste boundary areas where exposures may occur and not directly beneath the landfilled areas. Therefore, monitoring wells are not necessarily needed between the northeast section of Area 3 and the east and west seeps since they would only provide information on ground water quality beneath the landfill mass. Sampling of the east and west seeps provides adequate data to assess impacts outside the waste boundary downgradient of Area 3. Other monitoring wells are located southwest of Area 3 and downgradient of the east and west seeps. Specifically, these are well points WP-2, -3, and 4. The well points were designed as piezometers; to monitor shallow ground water in the vicintiy of probable discharge areas. The depth of the well points varied from 15 to 40 feet depending on the depth in which ground water was encountered during drilling. Sampling and analyses of these well points during the original remedial investigation conducted from 1987 to 1991 revealed very low VOC contamination with no single VOC above its respective MCL. In addition, the east and west seeps which also are local shallow ground water discharge points were sampled and continue to be sampled for inorganics. The seeps are no longer sampled for VOCs since historically, VOCS have not been found to be a problem with the seeps.

2. The Township finds the sampling and laboratory analyses appropriate. The Township draws attention to the discrepancy that occurs where laboratory reporting limits (thresholds) are above corresponding MCLS, AWQCS, or ER-M. The Township understands this may not be a correctable deficiency. However, at several places the report draws conclusions from results in this range of unsubstantiated data and the Township feels this is probably not appropriate.

   EPA Response: Reported data that are below the laboratory reporting limit but above the

method detection limit (MDL) are still useable. The MDL is generally the lowest amount of a substance that can be detected by an instrument taking into account the type of sample soil, water, etc.), reagents, and sample preparation. Due to the irregular nature of instrument or analytical method "noise", reproducible quantitation of a chemical may not be possible at the MDL. Generally, a factor of three to five is applied to the MDL to obtain a quantitation limit (e.g., laboratory reporting limit), which is considered to be the lowest level at which a chemical may be accurately and reproducibly quantitated. Typically, this data is qualified with a "J" flag, indicating that the chemical was positively identifled, but the associated numerical value is the approximate concentration of the chemical in the sample because the lab may not be able to accurately reproduce the result. These type of data are still useable and are appropriate to consider in making decisions regarding the presence of contamination.

3. Overall, the Township agrees that VOC concentrations for the Site are relatively low. The Township notes that several data points show exceedences of MCLs. The exceedances occur in wells MW-5, MW-6, MW-14, PZ-3,RW-2, and RW-3. MW-14 had the most exceedances, (tetrachlorethane, trichloroethane, and vinyl chloride). The Township notes that this well is located outside of the Site. Adding this area to the Site was discussed with the Township, and the Township feels the addition is necessary to the alternative plan. The exceedence at MW-6 reinforces this conclusion since that well is further downgradient.

   EPA Response: EPA agrees that continued monitoring of MW-14 is an integral part of the overall ground water rernediation strategy at the Old City of York Landfill Site. MW-14 was installed as an additional monitoring well to monitor the plume which likely originates near RW-2 flows off-property at MW-14 and back onto the landfill property near MW-6. Sampling of MW-14 during the Third Quarter 1998 sampling event revealed the presence of certain VOCs above their respective MCL. However, three subsequent rounds of sampling have not shown any MCL exceedances. Nonetheless, monitoring of MW-14 is necessary to support the natural attenuation determination.

4. The Township observes that three of the five recovery wells had VOC exceedances. The Township feels that exceedences in the recovery wells are significant because this demonstrates that the wells continue to draw contaminants from hotspots at the Site. The Township views this data as proof that ground water recovery are working to some degree. The Township notes with alarm that the Waldman well, located approximately 2,000 ft. west of the Site's southwestern boundary, exhibited a lead concentration above the EPA action level for lead. The Report dismisses this as not Site-related due to the distance. However, on-site ground water was not tested for lead and therefore the Township disapproves of the Report's conclusion about the source of lead. The Township questions whether this conclusion is appropriately conservative in the absence of more conclusive proof.

   EPA Response: EPA agrees that the ground water extraction and treatment is system is working to some degree. However, given that ground water VOC levels are so low, the pump and treat system is removing only a relatively minor amount of VOCs compared to the natural attenuation processes at the Old City of York Landfill Site and continued operation

provides only marginal additional benefit towards the remediation of ground water at the Site. With respect to the Waldman well, EPA is aware of the lead in his drinking water well. EPA undertook additional steps to conduct a thorough evaluation of Mr. Waldman's drinking water several years ago. This included obtaining samples from several locations within his home's plumbing system and his well. EPA informed Mr. Waldman of these exceedances at the time. The Township is correct in that on-site ground water is not currently being monitored for lead. Contaminants of concern at the Site include VOCs. Inorganic sampling was conducted during three separate rounds during the original remedial investigation. Lead was not identified as a contaminant of concern for ground water at the Old City of York Landfill Site. Lead was not detected consistently in the monitoring wells installed at the Site as part of the remedial investigation; and except for one location, it was not detected near the levels of those in his residential well. In fact, in monitoring well MW-9 which is located directly upgradient of his well, lead was detected at a concentration of only 1.2 ug/l in an unfiltered ground water sample. Lead was also detected in an unfiltered ground water sample from well WP-3 at 109 ug/l; however, since this result is from an unfiltered sample, the lead is probably particulate in nature (rather than dissolved in ground water) and would not be expected to be mobile in ground water. Furthermore, based on ground water elevation data, ground water at WP-3 is not expected to flow toward the Waldman well. Therefore, it is highly unlikely that the lead detected in WP-3 is associated with the lead detected in his well water.

5. Cadmium, copper, lead, mercury, selenium, and thallium. had chronic AWQCs below the laboratory reporting limit. Therefore, the Township notes that for these metals lack of a reportable quantity does not mean the chronic AWQC has not been exceeded.

   EPA Response: See Response to comment 2 above.

6. The Township observes that Seep Water 4 (SPW-4) exhibited a lead concentration of 24 ug/l. This is more than 5 times the chronic AWQC for lead (AWQC is 5.5 ug/L and EPA action level is 15 ug/l). The Township notes that this result is a sharp increase from previous years which exhibited levels below the laboratory reporting limit. The Township is alarmed by this result because of the distance from any hotspot and the relative lack of testing closer to hotspots. Lab equipment was double-checked to confirm the validity of the results. In particular, the Township feels this result raises concerns about whether lead and other contaminants have yet reached their peak concentrations at the Site.

   EPA Response: Surface water and sediments are monitored at the Old City of York Landfill Site on an annual basis. The Focused RI Report notes that lead concentrations during the 1993-1997 time period were below the calculated AWQC, and that the 1998 sampling event represents a notable deviation. Subsequent sampling during the September 1999 monitoring event revealed that the lead concentration at SPW-4 was 11 ug/l, again exceeding the calculated AWQC. EPA has stated that is not appropriate to directly apply AWQC directly to the seep areas because the seep areas are not the point of first designated use of the surface water. Nonetheless, EPA agrees that these lead concentrations warrant attention and

closer review. However, surface water impacts fall under the scope of the 1991 ROD, and therefore, EPA will pursue the appropriate course of action under the ARARs as cited in the 1991 ROD. Pursuant to the 1991 ROD, EPA will make a determination during the five-year review if further seep sampling is warranted and what, if any, corrective actions are necessary to address seep and stream water at the Site and ensure protection to human health and the environment.

7. The Township points out that the discussion of mercury found in SW-2 {p.4-4} demonstrates the inadequacy of the testing procedures for the chosen AWQC parameters. Mercury concentrations exceeded the chronic AWQC but were still below reportable limits. The Report generates a graph and hints that the results show a declining trend in mercury concentrations. The Township feels this conclusion is inappropriate. None of the data points used to generate the graph is reliable. The Township observes that the only reliable conclusion that can be drawn from this data is the presence of mercury at SW-2.

EPA Response: See Response to Comment 2.

8. Surface and sediment VOCs and SVOCs were not monitored after 1996. The Report draws the conclusion that the extraction wells have no impact on these parameters due to the distance between the hotspots and the monitoring location. The Township notes that Tables 4-3 and 4-5 do not fully support this conclusion but also observes that concentrations of surface and sediment VOCs and SVOCs at the Site are probably too low to raise any real concerns at this time.

EPA Response: EPA agrees with the Report's assessment that because of the relatively significant distance between the extraction wells and the streams and seeps sampled and the relatively limited area of influence of the extraction wells that no impact on flow of the streams and seeps or their quality would be expected. EPA also believes that Tables 4-3 and 4-5 of the Report support this conclusion since an evaluation of these tables reveals that total VOC and SVOC concentrations remained virtually identical for pre- and post-ground water treatment system extraction.

9. The Township notes that natural attenuation is a very difficult phenomena to demonstrate. The Site is not abiotic and therefore some degree of natural attenuation will occur. The Township feels the difficulty lies in persuasively showing that the process is sufficient to meet and maintain remediation goals and protect the health and well-being of Township residents. The Township understands that proving natural attenuation is difficult because of its highly complex nature. The Township also understands that, at best, most conclusions drawn about natural attenuation processes will be hypotheses based on assumptions that are scientifically uncertain.

EPA Response: EPA agrees that verifying that natural attenuation through biodegradation processes is a complex process. However, natural attenuation processes do not rely solely on biodegradation but also on other processes as described in the Proposed Plan and ROD

Amendment such as dilution, dispersion, sorption, volatilization, etc. As EPA has stated, biodegradation is not the primary mechanism of attenuation but rather dilution and dispersion are the primary factors.

10. After reviewing the Report, the Township observes that the location of the hotspots in well drained soils atop hills makes natural attenuation unlikely as a dominant process. The Township feels that dispersion and dilution will likely be the more dominant processes.

EPA Response: EPA agrees; See response to Comment 9 above.

11. The Report offers three lines of evidence for demonstrating natural attenuation: (1) stable or decreasing concentrations of contaminants; (2) biogeochemical conditions favoring degradative activity; and (3) presence of microbial activity capable of degrading the contaminants of concern. The Township feels the first line of evidence provides the strongest data and should be weighted appropriately. The Township regards the second and third lines of evidence as merely supportive because, as noted above, the natural attenuation process is too complex to draw conclusions from isolated parameters. The Township also notes that the third factor has not even been uniformly adopted by EPA.

EPA Response: EPA agrees that biodegradation is not the primary natural attenuation mechanism at work at the Site, rather dispersion and dilution are the primary factors involved with the natural attenuation processes at the Site. EPA has relied on the first line of evidence in evaluating and determining if natural attenuation is taking place at the Old City of York Landfill Site. EPA does not believe that biodegradation is proceeding to an appreciable extent and has not drawn any conclusions from the second and third lines of evidence.

12. The Township submitted several comments with respect to the biodegradation process taking place at the Site and the geochemical and microbial information gathered during the site investigation to determine if conditions are appropriate for biodegradation to occur at the Site.

EPA Response: *The Alternative Ground Water Remedy Evaluation Report* was carefully reviewed by technical experts at EPA's National Risk Management Laboratory, Subsurface Protection and Remediation Division in Ada, Oklahoma. Technical comments regarding the biodegradation potential are contained in the administrative record. It is EPA's opinion that biodegradation is not the primary attenuation mechanism at the Site but rather dispersion and dilution are the primary natural attenuation processes responsible for the reduction in contaminant concentration.

13. The Township feels the first line of evidence is unsupported by the data presented. First, historical data used for comparison of 1996 conditions to 1998 conditions may be biased because of the different testing times. The 1996 data was collected in May, likely corresponding to peak rainfall events. This could cause maximum leaching from hotspots

and above average contaminant concentrations at testing locations and maximum dispersion throughout the Site. Dilution could also occur if rainfall events produce elevated ground water flows. The 1999 data was collected in August, likely corresponding to peak drought conditions. This could minimize leaching and dispersion from hotspots and cause below average contaminant concentrations at testing locations within the Site. The data should have been collected during the same seasons or the collection times should have been reversed in order to produce conservative estimates. As such, the Township feels the calculations based on these data sets should not be considered

EPA Response: EPA disagrees with the Township that the first line of evidence is unsupported by the data presented. The data set prior to the operation of the pump and treat system were evaluated from some ground water monitoring points such as monitoring well MW-5 and the Boser well. EPA did not rely solely on comparing May 1996 to August 1998 data. The data collected at these wells, 16 samples since December 1983 through May 1996 for the Boser well and nine samples since October 1988 through May 1996 at MW-5 collected prior to pump and treat, indicate a decreasing trend in contaminant concentration (Figures 5-6 and 5-7, appendix H and I, RUST, November 1998). This decreasing trend is the first line of evidence that natural attenuation is occurring. Because of the low contaminant concentrations (only slight MCL exceedances at a few well locations) and the decreasing trend observed at the wells through time, EPA concludes that this Site would be a good candidate for a monitored natural attenuation remedy. EPA does acknowledge the Township's concerns regarding uncertainty associated with interpretation of a limited data set, and as part of this and any monitored natural attenuation remedy, its implementation will include monitoring of ground water to measure its progress to reach the ground water cleanup goals and guarantee that it is protective of human health and the environment. Additionally, the ROD amendment contains a contingency remedy of pump and treat if the ground water monitoring demonstrates that the monitored natural attenuation is not facilitating the aquifer to meet the cleanup levels or if it is no longer protective.

14. A comparison of Figures 5-4-and 5-5 seems to indicate that extraction has been somewhat successful at concentrating the extent of contamination. Figure 5-4's depiction of Area 3 would be significantly changed with the addition of MW-14 and would extend the extent of Area 3 contamination depicted in Figure 5-4. Figure 5-5 seems to show a concentration of contaminants around the extraction wells. Most notably, the plume extending in a southwest direction from Area 3 in Figure 5-4 has been eliminated in Figure 5-5. Had MW-14 existed in 1996 the plume would have likely been larger and thus concentration effects in 1998 may be understated by Figure 5-5. Contamination around Area 1 also seems to have been concentrated by the extraction wells.

EPA Response: Because monitoring wells MW-13 through MW-14 did not exist during the second quarter 1996 and the data are representative of different seasons, EPA acknowledges that it is difficult to compare them to make conclusions regarding the effectiveness of the pump and treat. The extraction well locations were selected at the most highly

contaminated wells, in fact some of the extraction wells are located beneath the landfill waste. Therefore, the isoconcentration maps prior to and after pump and treat should show contaminant concentrations at and around the pumping wells, which is the case. We do acknowledge that the pump and treat has removed some ground water contamination; however, given the low contaminant concentrations observed in the influent to the treatment plant as compared to the estimated reduction of ground water contamination overtime, pump and treat does not appear to be providing significant additional benefit in removing the ground water contamination. Continued monitoring of these most recent monitoring wells will be part of the MNA. Furthermore, if monitoring results indicate that MNA will not achieve the cleanup standards or is no longer protective of human health, the contingency remedy of pump and treat shall be implemented.

15. The Township notes that contaminant concentrations around the extraction wells should be lower in 1998 than in 1996 due solely to operation of the wells. The wells are pulling contaminants in from the surroundings but the contaminants are promptly extracted and do not have a chance to accumulate. Thus, when analyzing the isoconcentric maps presented by the Report, the Township feels it is more important to note the changes in the geographical area affected by the contamination rather than actual contaminant concentrations.

    EPA Response: When evaluating the effectiveness of a pump and treat remedy, it is common practice to depict the contaminant concentrations on a Site map for different sampling events to observe the effect of pumping on the contaminant concentrations over the Site (i.e. contaminant plume). Some of the extraction wells are located beneath or at the edge of the landfill. EPA does take into account the contaminant concentrations and the distribution of this contamination over the Site area and evaluates the area affected by ground water contamination. During the implementation of the monitored natural attenuation, monitoring of ground water to measure its progress to reach the ground water cleanup levels to guarantee that it is protective of human health and the environment shall be performed.

16. The Township observes that the Report gives a very basic “back of the envelope” calculation for the mass of subsurface dissolved VOCS. The Report admits the shortcomings of this method. The Township notes that the Report then compares this estimate to a much more accurate calculation of VOC recovery rate in extraction wells. The Township understands that this comparison may be useful due to the size of the discrepancy between the results (11 lbs. per year versus 1 lb. per year). However, the Report draws the conclusion that this much of this discrepancy may be attributed to natural attenuation. The Township feels such a conclusion is baseless. Many factors could be causing this result. Due to the well-drained nature of the topography and the highly variable hydraulic conductivity of the Site, the Township would first suspect dispersion and dilution as the main cause of the mass disappearance. Under these circumstances, the Township observes that dispersion and dilution, natural attenuation, and recovery wells are most likely all contributing to the mass disappearance phenomena.

EPA Response: EPA acknowledges that natural attenuation, most notably dispersion and dilution of contaminants, are contributing to the observed decrease in ground water contamination overtime. Pump and treat also is contributing to the reduction of ground water contamination. Based on the analysis of the data it appears that most of the reduction of ground water contamination is due to natural attenuation processes when compared to pump and treat.

17. The Township observes that the regression analysis is incomplete and does not demonstrate the trend the Report seeks to prove. The Township feels a regression analysis showing a *statistically significant* decreasing trend of VOC concentration prior to commencement of recovery would offer stronger evidence of natural attenuation. First, only two wells contained enough data prior to 1996 to perform regression analysis. As discussed before, the variability of the Site makes generalizations based on such isolated data tenuous at best. Second, the regressions performed are inconclusive. The Report gives an accurate analysis of r and r parameters. The regression has an r, of 0.70 which is adequate but by no means strong. The Report offers no explanation of p-values for the regression. The p-value measures how likely the observed deviation in the results could be explained by random variation as opposed to the hypothesized effect. The p-value is necessary to determine if the results have *significance*. Without any analysis of p-value the Report states that there is a significant decreasing trend in VOC concentrations over time. The Township suggests this conclusion may be premature without an explanation of the p-values for the regression.

EPA Response: Although the regression analysis provides a useful tool for forecasting the rate at which natural attenuation may occur, there are inherent uncertainties that may cause the actual results to vary from the forecast outcome. Such uncertainties may include: (1) the presence of continuous sources in the landfill areas: (2) effects of eventually shutting down the pump and treat system which may result in changes to contaminant concentrations and geochemical conditions due to the change in the aquifer flow regime; (3) the number of data points on which the regression analysis is based as well as whether the data has been collected at an adequate frequency to represent seasonal fluctuations; and (4) the evolution of daughter products related to natural attenuation. EPA acknowledges that there are limitations in utilizing a regression analysis. However, EPA did not rely solely on the regression analysis in making its determination to change the ground water remedy at the Old City of York Landfill Site to monitored natural attenuation. The regression analysis was only one of several factors EPA considered in its overall evaluation of the Site, including the level of contamination, stability of the contaminant concentrations, and the efficiency of the ground water pump and treat system.

18. The report draws several conclusions concerning historical VOC concentration trends from graphs of raw data collected in Areas 1 and 3. The Township feels these conclusions are inappropriate without first showing some type of statistical relevance to the data. Figure 5-6 may show a declining trend for MW-5 however, as discussed above, the trend in the data prior to 1996 is questionable. The data offered for RW-3 shows no trend prior to May 1996. The Township feels the Report's conclusions regarding this data are unsupported.

EPA Response: An exponential regression analysis was performed on MW-5 data that was collected prior to the pump and treat operation and the results indicate that there is a strong correlation for the decreasing trend in contaminant concentration at MW-5 with time as explained in Section 5 of the *Ground Water Remedy Evaluation Report*. EPA agrees that there is insufficient data for RW-3 to evaluate contaminant trend overtime prior to the pump and treat operation. Nonetheless, RW-3 is located beneath landfill waste and therefore would not be an appropriate location to monitor the progress of a ground water cleanup. The contaminated ground water at the edge of the waste and beyond shall be monitored to evaluate the progress of the MNA remedy to meet the cleanup objectives. Both MW-5 and MW-6 are monitoring wells located at the edge and down gradient of the waste. The regression analysis for both wells on the data collected prior to pump and treat indicate a decreasing trend.

19. Data in Figure 5-7 shows nothing conclusive. The Report concludes from that Figure that the Boser well was showing a downward trend in VOC concentration prior to May 1996. However, the majority of the decline occurs between two data points. The Township observes that this is an alarming gap in the data which the Report makes no attempt to explain. Most likely, some external event occurred around this time that has significantly skewed the data. Therefore, the Township feels that conclusions drawn from this data would be unsupported.

EPA Response: The conclusions drawn from Figure 5-7 are supportable. Routine quarterly monitoring of the wells at the Old City of York Landfill Site did not begin until June 1995. Prior to this time, monitoring occurred in support of different events. Monitoring in the early 1980's was associated with the initial assessment of the Site and for inclusion on EPA's Superfund National Priorities List. Monitoring conducted in the late 1980's and first part of 1990 was in support of the original remedial investigation conducted at the Site. Monitoring from 1993 - 1995 was in support of designing the current ground water extraction and treatment system for the Site. While the reason for the sudden drop of VOCs in the Boser well from May 1986 to October 1986 may not be obvious, it may be attributable to natural attenuation. What is apparent is that the overall VOC levels have been generally declining over the approximate twenty year history that this Site has been monitored. Such a decline in VOCs would be expected in landfills which are not capped with an impermeable cover. In this type of situation, landfill contaminants slowly leach from the landfill mass thereby depleting the original contaminant materials contained in the landfill.

20. The Township notes that the spatial variation of concentration data does not clearly support the conclusion the Report draws. The spatial variation is probably caused by dispersion and dilution as well as natural attenuation. The data presented in the Report does evidence some type of degradation *or* dilution. However, data was only used for one year which means the graph does not have any historical significance. The Township feels that a better graph would have presented data points since 1996.

EPA Response: EPA agrees that dilution and dispersion are the primary attenuation

mechanisms taking place at the Site. EPA did not rely solely on the spatial variation of concentrations of the contaminant plume in making its decision. Typically, a contaminant plume will decrease in concentration with distance from a source area. In this case, EPA is more interested in contaminant concentration declines in fixed monitoring points with respect to time so generation of another graph including data points since 1996 would not provide significant additional information.

21. The Report suggests that natural attenuation together with institutional controls will be capable of achieving MCLs as established by the Site ROD. As discussed above in Section III, the Township questions the extent to which natural attenuation will contribute to achieving this result. The institutional controls relied on by the Report are similar to the deed restrictions placed on the Boser property: "No wells, ponds, impoundments or other structures or facilities for the recovery of ground water or surface water shall be constructed or used to recover water from on or beneath the Property for any purpose, including home, commercial, agricultural or industrial use, irrigation, cooling, or other use." The Township notes that the restrictions placed on the Boser property as outlined in Section 2.1 of the Report are actually stricter than this. According to the portion of the Report the restrictions further include limits on recreational use and further development or subdivision of the property. The Township finds these institutional controls unacceptable in the long-term.

EPA Response: EPA believes that natural attenuation processes, mainly dispersions and dilution, will achieve MCLs. The additional institutional controls contemplated for the Old City of York Landfill Site are separate and should not be as restrictive as the restrictive covenant on the Boser property. The institutional controls on the Boser property are more restrictive because 56 acres of the 178-acre tract are landfill areas which may not be disturbed. The institutional controls contemplated for adjacent properties may include ground water extraction restrictions for existing ground water wells and/or restriction of new well installations, as necessary, as not to inadvertently draw contamination off the property. No other effects should be observed by the residents as far as any other use of their land for any purpose.

22. The Township draws attention to the fact that the site ROD originally required clean-up to background levels but was later changed to specify clean-up of nine contaminants to MCLS. The Site has not achieved the established goals of the revised ROD. Now WMI seeks to do this in conjunction with institutional controls (which is acceptable by EPA guidelines). However, the Township feels that the institutional controls required render the land useless and, based on the Report's inability to adequately prove natural attenuation, would essentially release WMI from achieving the goals of the ROD and remediating the Site. The Township does not feel this outcome is appropriate at this time. The Township is not persuaded that the institutional controls suggested by WMI will return the land to a useable state nor does the Township feel they are consistent with the goals of the ROD.

EPA Response: EPA disagrees with the Township's assertions with regard to the cleanup levels and the impact of the institutional controls. The goal of this ROD Amendment is the

same as the goal of the original 1991 ROD. The ground water must be cleaned up to drinking water MCLs throughout the area of attainment. The method of how MCLs are to be achieved, however, has changed. Based upon the information available, it appears that natural attenuation processes are as likely to continue to reduce contaminant concentrations to MCLs as is continued operation of the pump and treat system and will do so in a similar time frame. The purpose of the institutional controls is to provide an additional protective measure to ensure that the contaminant plume is not inadvertently drawn off-property until the goal of achieving MCLs is met. They should not prevent productive use of the land. In the unlikely event that the monitored natural attenuation remedy does not work and more active means of ground water cleanup are necessary, the pump and treat remedy will remain as a contingency.

23. The Township feels the Report understates the effectiveness of the current remediation strategy. The extraction wells do seem to have concentrated contamination and eliminated the plume extending in a southwesterly direction from Area 3. Conversely, the Township feels the Report overstates the effectiveness of natural attenuation. As discussed in Section III, the Report has not shown adequate evidence of sufficient natural attenuation at the Site. Moreover, the Township disapproves of the suggested institutional controls.

EPA Response: See Response to Comment 14 above. It appears that there is enough evidence to demonstrate that natural attenuation is occurring at the Old City of York Landfill Site. EPA acknowledges the Township's disapproval of the institutional controls; however, the modified remedy is the most practical and practicable course of action for this Site given the limitations of the pump and treat system in remediating such low levels of contamination in the ground water at the Site.

24. The Report states that pumping from extraction wells has not significantly reduced off-site migration of contaminants. This conclusion may be incorrect. Pumping from the extraction wells has reduced migration from hotspots and consequently off-site migration.

EPA Response: Pumping of the extraction wells has not significantly altered ground water flow patterns and the cone of influence of the extraction wells is limited in extent. Therefore, it is unlikely that off-site migration of contaminants has been significantly influenced by the operation of the ground water extraction system.

25. The fact that current remediation has not achieved the established MCL goals of the ROD is not a basis to abandon the remediation strategy unless a more effective strategy is proven and adopted. Natural attenuation has not been shown capable of achieving the ROD's established goals. Without better evidence of effectiveness, the Township does not approve of this remediation strategy as an acceptable alternative for achieving compliance with MCLs.

EPA Response: The current pump and treat system is not being abandoned because it has not achieved MCLs in ground water. The pump and treat system remedy is being

discontinued because it is providing only marginally additional benefit toward achieving MCLs beyond the natural attenuation processes at the Site and its continued operation is not practicable. EPA believes that monitored natural attenuation is appropriate for the Old City of York Landfill Site. The aquifer will continue to be monitored to ensure that the contaminant plumes are stable or decreasing in extent. Should this monitoring reveal that monitored natural attenuation is not protective, the pump and treat system will be used as a contingency measure.

26. Again, natural attenuation has not been adequately proven effective over the long-term. The Township sees no reason why WMI should be allowed to alter the current remediation strategy until the ROD established MCL goals are met or an effective alternative remediation strategy is adopted. The Township does not believe the alternative plan achieves these goals.

EPA Response: As EPA has stated previously, monitored natural attenuation should be as effective as continued operation of the ground water extraction and treatment system in achieving the goal of remediating ground water to MCLs. EPA is also convinced that, based on an evaluation of long-term effectiveness, monitored natural attenuation should be as effective as the current remedy in the long-term.

27. The Report acknowledges the efficacy (albeit not highly efficient) of ground water extraction. The conclusion that changing to a natural attenuation strategy would promote anaerobic activity is unsupportable and even directly refuted by some evidence.

EPA Response: As previously stated, biodegradation is not the primary attenuation mechanism taking place at the Site. EPA is relying on the dilution and dispersion aspects of natural attenuation to achieve the clean-up goals because of the low concentration of contaminants at the Site. Regardless of the anaerobic or aerobic conditions at the Site, the geochemical parameters at the Site are not entirely conducive to biodegradation.

28. The Report states that the risks associated with natural attenuation are acceptable based on levels of contaminants and the lack of pathways of exposure (i.e., institutional controls). This may be true but as discussed above the institutional controls are unacceptable and the level of risk without them is probably unacceptable also.

EPA Response: EPA acknowledges the Township's position on the institutional controls. The purpose of the institutional controls is to provide an additional safeguard to ensure that the contaminant plume is not inadvertently drawn off-property which may result in a future exposure pathway for an off-property residence.

29. The Report acknowledges that the ground water extraction system is already in place and the technology being used has proven effective if not efficient or economical. However, efficiency comparisons with natural attenuation are difficult because the effectiveness of natural attenuation at achieving ROD established goals is not sufficiently supported by the

Report. The Report states that if remedial action would be required in the future either alternative could be implemented to achieve the goals. However, WMI has stated to the Township that the extraction and ground water treatment equipment would be removed if the alternative plan were adopted. The Township worries that this would make it extremely difficult to re-instate ground water recovery in the future. The Report states that the alternative plan is administratively feasible but requires *ongoing* enforcement of institutional controls. The Report does not suggest who will be responsible for ongoing enforcement and the Township fears this duty is likely to fall on it. The Township feels any alternative plan should account for this added enforcement burden on its own rather than relying on the Township.

EPA Response: Based on the available information, natural attenuation processes, mainly dispersion and dilution, should be effective in reducing contamination at the Site. However, as a safeguard, EPA has required in the ROD Amendment that should the contaminant plume begin to significantly increase in size, that the pump and treat remedy would be restarted as a contingent remedy. Should a contingent remedy be triggered, an Explanation of Significant Differences ("ESD") or ROD Amendment would be required. EPA will carefully evaluate the effectiveness of the natural attenuation remedy for several years prior to making any determination that the existing pump and treat system be abandoned. The institutional controls will provide another factor of safety in ensuring that contaminated ground water is not inadvertently drawn off-property. EPA acknowledges that Springfield Township does not want to incur any enforcement responsibilities with respect to the institutional controls and is not requesting that the Township do so in this ROD Amendment.

30. The Report's cost estimates seem valid although it is difficult to know this for certain without further independent research. The current plan is estimated to cost more over the life of the remediation. The additional cost is estimated to be $512,612 over 28 years or $18,308 per year. The proposed plan includes considerably less monitoring of the Site than the current plan. The Township draws attention to the fact that the Report is not completely clear on what the precise differences would be and this is probably still subject to negotiation between EPA and the responsible parties.

EPA Response: The monitored natural attenuation remedy monitoring program has not been finalized, but it will cover key wells in insuring that natural attenuation processes continue to be effective and that the contaminant plume remains stable without significant increase in size. It may be likely that the natural attenuation monitoring may include the monitoring of fewer wells than under the previous pump and treat remedy.

31. Finally, be assured , Springfield Township, York County, Pennsylvania has no intention to impose "Institutional Controls" on the area here at issue. This precludes a Zoning Ordinance Amendment, any general ordinance, any Subdivision and Land Development Ordinance amendments, Resolution(s) or any other regulatory action. It is unfortunate that the property owners shall bear the brunt of this Alternate Plan via their inability to sell their land at its once fair market value or, probably, unable to even give it away. These people must now

cope with the EPA's "walking away" from this problem as will WMI.

EPA Response: EPA acknowledges that Springfield Township has no intention of imposing any institutional controls as they may relate to the Old City of York Landfill Superfund Site, and is not requesting that the Township do so in this ROD Amendment. The institutional controls that are currently being contemplated should not have a sigmficant, if any, impact on property values.

C. Comments Submitted by Potentially Responsible Parties

1. A PRP noted that EPA listed various corporations that are responsible for the cost. The commentor asked if additional corporations would be involved and who would be dividing the cost, and when would negotiations begin.

EPA Response: EPA has issued approximately 26 additional General Notice Letters (GNL) to various companies notifying them of their potential liability with respect to the Old City Of York Landfill Site. EPA's goal is to bring these additional parties to the negotiation table with the current PRPs to negotiate a settlement for the remaining costs at the Site. EPA has not set a negotiation timetable, however it is EPA's desire to complete these negotiations in a timely manner.

2. While WMPA agrees that the PRAP, and subsequently the ROD, should provide for a means to trigger a contingency should Monitored Natural Attenuation (MNA) with Institutional Controls not prove protective of human health and the environment, we do not believe that ground water extraction and treatment should be predetermined as the most effective contingent remedy. We believe that the data generated during subsequent monitoring may provide the Agency additional information on which to determine the most effective contingent remedy. This will allow for the application of any appropriate technology, should a contingency be triggered. As discussed in the PRAP, the ground water extraction and treatment system is only marginally effective. It would therefore seem more appropriate to allow for flexibility in the PRAP/ROD to determine if more appropriate contingent remedies may be available. EPA itself has documented that ground water pump and treat systems are typically ineffective in achieving ground water cleanup levels, particularly when compounds are at low levels, such as at the Site. We suggest that the potential contingent remedy(ies), as well as triggering criteria, be developed in the O&M Plan to be approved by the Agency, with input from the various Site stakeholders.

EPA Response: EPA believes that for the Old City of York Landfill Site that ground water pump and treat would be the most effective contingency. This does not mean however, that the pump and treat cannot be modified (i.e., more extraction wells) to increase its effectiveness, if necessary. Identifying contingent remedies and triggering criteria in the O&M plan is not appropriate since the Record of Decision forms the legal basis for the selection of a remedy. Should a contingency remedy be triggered, an ESD or ROD amendment would be required which would allow for input from the various stakeholders.

3. The **Summary of Alternatives; (Page 11, Paragraph):** states that "in the event that the monitoring results reveal that the plume is expanding and/or natural attenuation processes are not protective of human health or the environment." Most troubling here is the "and/or" clause. This would seem to indicate that either condition would trigger the restart of the pump and treat system. As stated in the PRAP, the mechanisms of MNA include dispersion. Dispersion of contaminants by definition may be characterized as "plume expansion". We do not believe the Agency intends to trigger a contingency for minor changes at the margins of the plume which would pose no additional or unacceptable risk to human health and/or the environment. In fact, what may appear to be expansions of the plume may only be the result of enhanced detection capabilities during ground water sample analyses or the statistical variation in sample results. Consistent with the text of the PRAP in Paragraph 2 on Page 11, the contingency should be triggered only if the MNA with Institutional Controls remedy were found to pose an unacceptable risk to, or not to be protective of, human health and/or the environment. We suggest that the protocol for determining such protectiveness should be described in the Operation and Maintenance (O&M) Plan which will be approved by the Agency.

EPA Response: EPA does not intend on triggering a contingency for minor changes at the margins of the plume which would pose no additional or unacceptable risk to human health or the environment. The language in the ROD Amendment has been reworded to state "in the event that monitoring results reveal that the plume is *significantly* expanding and/or natural attenuation processes..." to address the plume expansion issue. EPA has determined that the contingency should be triggered should either condition be met.

4. **Section VIII - Summary of Alternatives; (Page 11, Paragraph 1):** "This monitoring program will consist of 30 years of quarterly sampling with potentially reduced frequency for some or all of the monitoring wells to semiannual or annual thereafter based upon statistical evaluation of the first 8 quarters of data."

WMPA interprets the above language to mean that the entire monitoring period will be thirty (30) not that an additional thirty (30) year quarterly monitoring program will be required. Since the remedial action began in 1995, the monitoring program in 1999 is already in its fourth year. Therefore the remaining monitoring period should be adjusted to account for the portion of the period which has already elapsed. [Note that this reduction is consistent with the language in Section IX. - Evaluation of Alternatives and the Preferred Alternative, Subparagraph G. - Cost, Page 14, which indicates the " ...anticipated end of remedial action in 2025.']

With regard to monitoring frequency, WMPA believes that the quarterly monitoring contemplated in the PRAP has already been conducted and that an additional eight (8) quarters of quarterly monitoring is not necessary and is not justified based upon historic quarterly ground water monitoring results for the Site. Monitoring results to date, including pre-pumping results, have indicated very little fluctuation in ground water quality on a quarterly basis. It is important to note that the basis for the proposed ROD amendment is

that ground water quality data have shown very limited ground water quality impacts and that the Site does not pose an unacceptable risk to human health or the environment. Requiring quarterly monitoring, while possibly appropriate where limited data exists, is not appropriate for the Site where extensive data is available. We believe that the exact nature of the monitoring program, including well selection, monitoring parameters, and monitoring frequency, is best developed during preparation of the O&M Plan. During the development and approval process of the O&M Plan, appropriate input can be obtained from the various Site stakeholders prior to final approval by the Agency.

EPA Response: EPA agrees that the first five years of monitoring toward the eventual remediation of the Site has been conducted and that 25 years are now remaining. EPA acknowledges that there is a significant historical ground water data base in relation to the Old City of York Landfill Site including historical ground water results prior to commencement of the current ground water extraction and treatment system. Nonetheless, eight quarters of monitoring should follow the discontinuation of the ground water pump and treat system in order to ideally assess ground water conditions under non-pumping conditions, unless WMI can demonstrate to EPA and PADEP's satisfaction otherwise. At a minimum, four consecutive quarters must be conducted after the pump and treat system is shut down to assess contaminant and aquifer response. In any case, if there is a significant expansion of the plume, especially off-property, following the discontinuation of the ground water extraction system, EPA reserves the right under this ROD Amendment to revise the scope and frequency of sampling, as necessary.

5. **Section VIII - Summary of Alternatives; (Page 11, Paragraph 2):** "The statistical analysis method and approach will be outlined in the Operation and Maintenance (O&M) Plan for the Site. For all samples which are "nondetect:, the detection limit concentration will be used when performing the statistical evaluation. The exact wells which will be utilized to monitor the natural attenuation processes will be determined in the O&M plan. Following the statistical evaluation of ground water data, if the data indicates that the plume has expanded and VOCs continue to migrate off-site at levels that pose an unacceptable risk to human health and/or the environment, and/or natural attenuation processes are not protective to human health and the environment, a contingency measure including restarting the existing pump and treat system wll be implemented."

Here again, we believe that the PRAP is overly specific and should modified to allow for developing data management protocols during preparation of the O&M Plan. If the statistical method will not be chosen until the development of the O&M Plan, it does not seem prudent to specify the handling of "non-detect" values in the PRAP/ROD. The appropriate methodology for handling "non-detects" can vary depending upon the statistical method chosen. Therefore, we suggest that the statistical methodology and the specific data management protocols be developed during the preparation of the O&M Plan.

The above language of the PRAP also appears to suggest that VOCs are presently migrating off-site at levels that pose an unacceptable risk to human health or the environinent. We

believe this may be misleading. We believe that the text of the PRAP should be consistent throughout and suggest the language found above, which ties the triggering of a contingent remedy to non-protectiveness, is appropriate. We believe the amended ROD should reflect the triggering of a contingency to an unacceptable risk, not just the potential expansion of the plume or plume migration within the Site.

EPA Response: EPA has removed references to data management protocols from the ROD Amendment. EPA agrees these are better addressed during the development of the O&M Plan. EPA has clarified the above language by changing "... VOCs continue to migrate off-site at levels..." to "...VOCs migrate off-property at levels..." With respect to triggering the contingency remedy, please see Comment 3 above.

6. **Section VIII Summary of Alternatives; (Page 11, Paragraph 3):** To reduce the potential for human exposure due to the Site, ground water extraction controls shall be implemented on nearby individual properties, as necessary, to prohibit or restrict ground water use within the immediate vicinity in order to prevent migration of the existing plume."

As you know, the area surrounding the Site is served by a public water supply system and all properties within the "Proposed Ground water Usage Moratorium Area" currently use this public system for drinking, water. Further, Springfield Township has been enforcing a construction moratorium within the Site area which would appear to be sufficient to limit the potential for ground water usage. In addition, the landfill property currently has appropriate deed restrictions in place. WMPA questions the need for additional ground water usage restrictions at this time or as a condition of the remedy modification. As you are aware, the issues involved in attempting to place restrictions on private property are considerable. Since the need for any additional ground water usage controls would only be necessary to mitigate a potential future change in ground water usage in the area, we feel it should be considered as part of a contingent remedy. As such, the ground water usage controls would only be required if certain triggering criteria were met. We therefore ask that the Agency consider the need for any additional property controls as part of a contingent remedy, which we suggest is best developed as part of the O&M Plan.

EPA Response: EPA understands that the issues involved in attempting to place institutional controls on private property are considerable. However, the institutional controls are an integral part of the remedy and need to be placed in order to ensure protection to human health and the environment. The purpose of the institutional controls is to restrict or prohibit ground water use in certain areas in order to prevent contamination from inadvertently being drawn off-property. The institutional controls are meant to be a proactive preventative safeguard. If EPA were to consider the institutional controls as part of a contingent remedy, rather than a preventative safeguard, they would be a reactive measure in response to contamination already being drawn off-property and potentially would not be as effective in protecting human health or the environment.

D. Comments Submitted by the Commonwealth of Pennsylvania

1. PADEP's Land Recycling and Environmental Remediation Standards Act (Act 2), Section 106 (a), specifically states that the regulations promulgated under Act 2, 25 PA Code Chapter 250, Administration of the Land Recycling Program, are ARARs under a CERCLA action. Remediation standards for ground water to surface water are found under Section 250.406 and specifically address 25 PA Code Chapter 93 (Water Quality Standards). Section 93.8 (a) refers to 25 PA Code Chapter 16 (Water Quality Toxics Management).

   EPA Response: PADEP has identified Act 2 as an ARAR for this remedy; EPA has determined that Act 2 does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the federal standard.

2. The Clean Streams Law Act of June 22, 1937, P.L. 1987, No. 394, as amended, 35 P.S. Sections 691.1 et. seq., preserves and improves the purity of the waters of the Commonwealth for the protection of public health, animal and aquatic life.

   EPA Response: The Clean Streams Law is currently an ARAR under the 1991 ROD. Therefore, EPA does not plan on readdressing this ARAR in this ROD Amendment.

RECORD OF DECISION AMENDMENT
OLD CITY OF YORK LANDFILL SUPERFUND SITE
YORK COUNTY, PENNSYLVANIA

DECLARATION

SITE NAME AND LOCATION

Old City of York Landfill Site
Springfield Township, York County, Pennsylvania

STATEMENT OF BASIS AND PURPOSE

This Record of Decision Amendment ("ROD Amendment") modifies the selected remedy described in the Record of Decision for the Old City of York Landfill Superfund Site ("Site") issued by the U.S. Environmental Protection Agency ("EPA") on September 30, 1991 ("1991 ROD"). In the 1991 ROD, EPA selected a ground water pump and treat remedy to remediate contaminated ground water at the Site. The current remedial action (ground water recovery and treatment) selected for the Site is only marginally effective. Estimates of the total volatile organic compound ("VOC") recovery by the pump and treat system indicates that less than one pound per year is being recovered compared to the loss of 11 pounds per year through natural attenuation processes. Continued operation of the existing pump and treat system adds little additional benefit toward remediation of the ground water at the Old City of York Landfill Site. VOC levels are overall at very low levels, particularly along the Site boundaries. Continued operation of the pump and treat system is not expected to significantly reduce off-property migration of VOCs.

This decision document presents the selected remedial action for contaminated ground water at the Old City of York Landfill Site. The selected remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended, ("CERCLA") and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP").

The Commonwealth of Pennsylvania concurs with the selected remedy for the Old City of York Landfill Superfund Site described in this ROD Amendment.

ASSESSMENT OF THE SITE

The response action selected in this ROD Amendment is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

DESCRIPTION OF THE SELECTED REMEDY

This response action addresses contaminated ground water at the Old City of York Landfill

Site. The 1991 ROD addressed the contaminated ground water by using a ground water pump and treat system. That remedy has proven to be only marginally effective in reducing ground water contamination at the Site.

The selected remedy in this ROD Amendment includes the following major components:

- Monitoring of natural attenuation processes to measure changes in contaminant concentrations in the ground water at the Site until the cleanup levels are achieved.

- Placement of institutional controls (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) prohibiting ground water extraction from existing wells or the installation of any new wells, as necessary, to prevent migration of the contaminant plume off the landfill property boundary.

- Initiation of a ground water pump and treat contingent remedy if EPA determines, in consultation with the Pennsylvania Department of Environmental Protection (PADEP), that natural attenuation processes are not protective of human health and the environment. Should a contingent remedy be triggered, an Explanation of Significant Differences ("ESD") or ROD Amendment would be required.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate, and is cost-effective. EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a cost-effective manner at the Site. The selected remedy does not require treatment because the current remedy (ground water extraction and treatment) achieves only marginal additional protection in relation to the additional cost.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a statutory review will be conducted every five years after the commencement of the remedial action to ensure that human health and the environment continue to be adequately protected by the remedy. Since the original 1991 ROD remedial action commenced in November 1995, the first five year review for this Site will be conducted by November 2000.

3/31/00

Abraham Ferdas, Director
Hazardous Sites Cleanup Division
U.S. EPA, Region III

Date

DECISION SUMMARY
OLD CITY OF YORK LANDFILL SUPERFUND SITE

INTRODUCTION

The Old City of York Landfill Site ("Site") is a former municipal waste landfill that was operational from 1961 to 1975 and was intended to receive only municipal waste. The landfill was owned and operated by the City of York until 1968, at which time the operation of the landfill was transferred to private firms which were under contract with the City of York. Material disposed of at the landfill was predominantly municipal refuse with some commercial and industrial wastes. The U.S. Environmental Protection Agency ("EPA"), following consultation with the Pennsylvania Department of Environmental Protection ("PADEP"), is issuing this Record of Decision Amendment ("ROD Amendment") to address contaminated ground water at the Site. The selected remedy described in this ROD Amendment was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, U.S.C. §§ 9601 et al. ("CERCLA"), and the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP").

In 1991 EPA issued a Record of Decision ("ROD") for a ground water pump and treat remedy to remediate contaminated ground water at the Site. This ROD Amendment addresses the contaminated ground water by discontinuing the operation of the existing ground water extraction and treatment system and relying on monitored natural attenuation ("MNA") to attain the ground water cleanup standards specified in the 1991 ROD. All other aspects of the remedy selected in the 1991 ROD will remain unchanged. This ROD amendment also establishes a contingent remedy for restarting the existing pump and treat system if EPA determines, in consultation with PADEP, that the MNA remedy is not protective of human health and the environment. Should a contingent remedy be triggered, an Explanation of Significant Differences ("ESD") or ROD Amendment would be required.

In accordance with Section 117 of CERCLA, 42 U.S.C. § 9617, the Focused Remedial Investigation/Feasibility Study Report ("Focused RI/FS"), Proposed Remedial Action Plan ("Proposed Plan"), and background documentation for the Old City of York Landfill Superfund Site were made available to the public on September 10, 1999 in the local information and administrative record repository at the Jacobus Village Library, Jacobus, Pennsylvania. In accordance with Section 300.825 (a)(2) of the NCP, this ROD Amendment will become part of the administrative record file. The administrative record file is available for review at the following locations:

Village Library
35 C North Main Street
Jacobus, Pa. 17407
(717) 428-1034

A copy of the administrative record file is also available to the public at the EPA Region III offices, 1650 Arch Street, Philadelphia, Pennsylvania, 19103.

U.S. EPA Docket Room
Contact: Ms. Anna Butch (3HS01)
Administrative Record Coordinator
1650 Arch Street
Philadelphia, PA 19103
(215) 814-3037
Hours: Mon-Fri
8:30 AM - 4:30 PM

For a detailed description of the Site background and Site characteristics, refer to the 1991 ROD, Focused RI/FS, and the Proposed Plan for this ROD Amendment.

SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

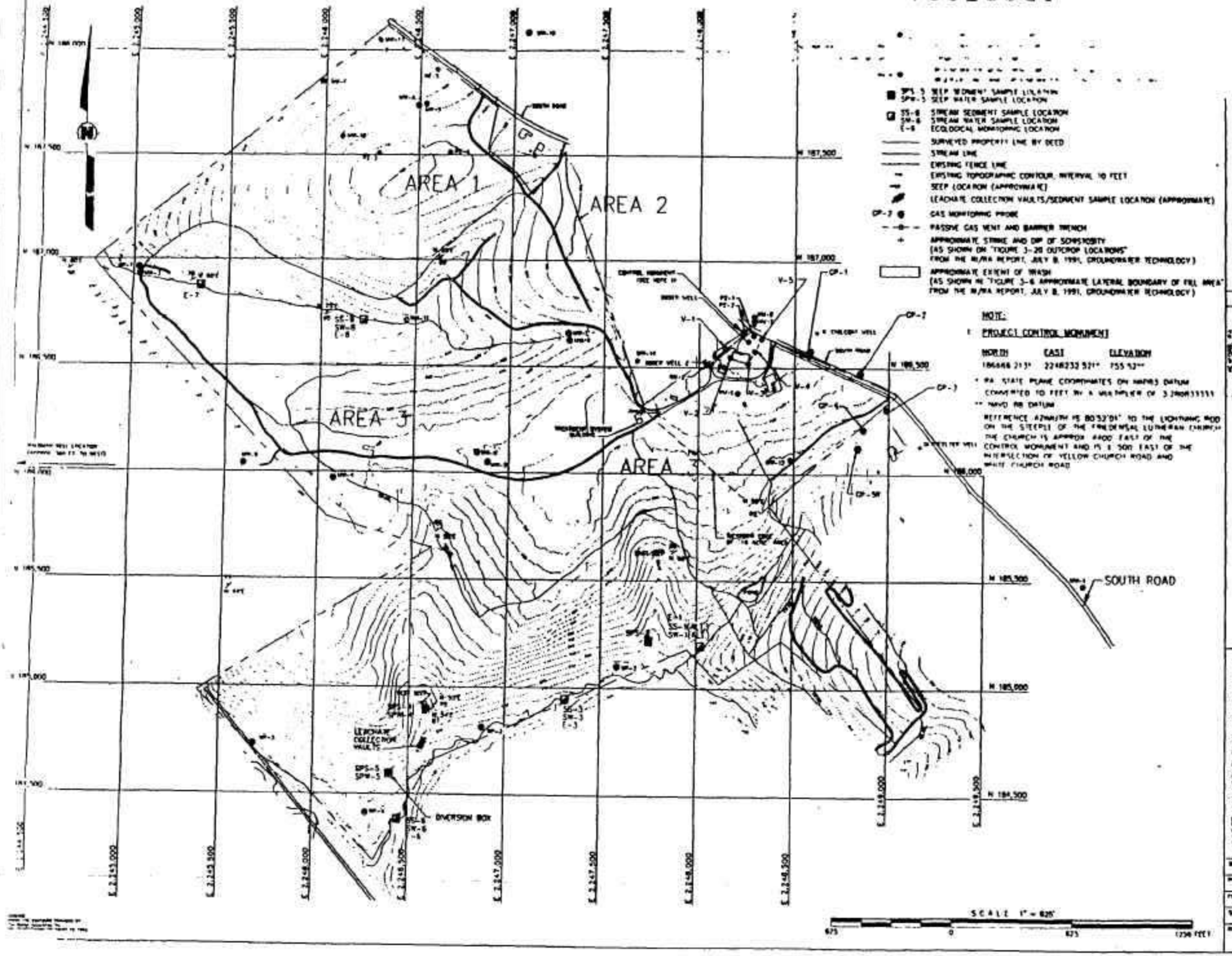
A. History

The Old City of York Landfill Superfund Site (the "Site") is located in a rural setting approximately 10 miles south of the City of York, on South Road in Springfield Township, York County, Pennsylvania. According to local tax maps, the Site occupies a 178-acre tract of land. Approximately 56 acres of the Site were actually landfilled.

The Old City of York Landfill was operational from 1961 to 1975 and was intended to receive only municipal wastes. The landfill was owned and operated by the City of York until 1968, at which time the operation of the landfill was transferred to private firms which were under contract with the City of York. Material disposed of at the landfill was predominantly municipal refuse with some commercial and industrial wastes. Refuse was disposed in three areas: Areas 1, 2, and 3 (Figure 1). The landfill was closed in 1975, and the property was sold to Dr. Roger and Mary Lou Boser in 1978. The Bosers currently own and reside on the Site property. The Site is currently used mainly for grazing of horses and recreation by the current landowner, and a small northern section of the Site (not over landfilled areas) is leased to grow crops for animal consumption.

Based on questions concerning water quality raised by local private residents in the early 1980's, a residential well sampling program was undertaken to analyze well samples for volatile organic compounds ("VOCs"), metals and other water quality parameters. VOCs were reported in six residential wells located adjacent to the Site. As a result of the presence of VOCs in these residential wells, a public water main was installed along South Road from the Town of Seven Valleys, located 1.5 miles northwest of the Site. In 1982, a construction moratorium was recommended to Springfield Township by the Pennsylvania Department of Environmental Protection ("PADEP"). Ground water usage restrictions are discussed in more detail in the Risk Assessment portion of this document.

FIGURE 1



B. Enforcement Activities and History of Regulatory Involvement

Under the provisions of CERCLA, the Site was placed on the National Priorities List ("NPL") in December 1982 with a hazard ranking score ("HRS") of 31.09. On October 27, 1987, the City of York, Rite-Way Services, and Alleco, Inc. (on behalf of the Macke Company and Service America Corporation) entered into an Administrative Order on Consent with EPA to conduct the original remedial investigation and feasibility study ("RI/FS") for the Old City of York Landfill Site.

Based on a review of chemical concentrations measured in ground water monitoring wells on-site during the original remedial investigation, federal and state drinking water standards, referred to as maximum contaminant levels ("MCLs"), were exceeded for the following chemicals: 1,2-dichloroethane, tetrachloroethene, 1,1,2-trichloroethane, trichloroethene, and vinyl chloride.

On April 9, 1991, a restrictive covenant was placed on the entire 178-acre tract by the property owner which prevents: ground water and surface water usage; further development or subdivision of the property; the use of additional areas for agriculture; and disturbance of the surface soils for any purpose except as required by the United States or Commonwealth of Pennsylvania.

Based on the results of the original RI/FS, EPA issued a Record of Decision ("ROD") for the Old City of York Landfill Site on September 30, 1991. The selected remedy included:

- Restoration of the soil cover in the northeastern portion of Refuse Area 3 to a two foot minimum;
- Operation of a ground water recovery/treatment system in both refuse Areas 1 and 3 and the installation of additional extraction wells in these areas, if needed;
- Removal of sediments from the concrete collection vaults with subsequent disposal at an off-site permitted treatment, storage, or disposal facility (sediments were allowed to be disposed of on-site under the soil cover pursuant to an Explanation of Significant Differences ("ESD") dated September 27, 1996);
- Installation of a landfill gas venting system to prevent landfill gas migration;
- Construction of a perimeter fence at the leachate collection vaults to prevent public access, and;
- Implementation of a ground water and surface water/sediment monitoring program to ensure continued protection to human health and the environment.

The ROD stated that the ground water extraction system would continue to operate until clean up standards for contaminants were reached throughout the areas of attainment. The area of

attainment is defined to encompass the area outside the boundary of Areas 1 and 3 and up to the boundary of the contaminant plumes. To evaluate the effectiveness of the ground water extraction and treatment system, the ROD required that ground water be monitored on a quarterly basis until the cleanup levels were achieved.

EPA issued a Unilateral Administrative Order ("UAO") on June 30, 1992, to the following parties for the performance of the remedial design/remedial action ("RD/RA") at the Old City of York Landfill Site: Rite-Way Services, Inc. (predecessor to Waste Management of Pennsylvania, Inc.); Stewart and March, Inc.; York Wrecking Company Inc.; Service America, Corporation; Litton Industrial Automation Systems; Inc.; and A.B. Chance Company, Inc. The RD was completed in May 1995. The remedial action contract was awarded on October 13, 1995, and construction started on November 6, 1995. A Preliminary Construction Completion Report ("PCOR") was issued on September 27, 1996, documenting that remedial construction activities were substantially complete. The ground water pump and treat system commenced operation in June 1996 prior to the completion of all the construction activities at the Site.

The Final Remedial Design provided for ground water extraction in two areas which historically had the highest levels of volatile organic compounds ("VOCs") in ground water: Area 1 (MW-5 and RW-3 wells) and the northeast section of Area 3 (Boser, RW-1, and RW-2 wells). The ground water recovery system consisted of the installation of submersible pumps and wellhead equipment at five extraction wells, installation of a ground water conveyance system, and construction of a ground water treatment building which houses an air stripper and off-gas treatment systems for removal of VOCs from extracted ground water and off-gases, with discharge of treated water to an on-site surface waterway.

Start up of the ground water extraction and treatment system occurred on June 17, 1996. Since that time, the extraction and treatment system has been in virtually continuous operation, excluding minor downtime, and has been operating as designed.

BASIS FOR THE DOCUMENT

I. Introduction

On September 1, 1998, Waste Management of Pennsylvania, Inc. ("WMPA") submitted a formal request and proposed scope of work to EPA to modify the remedy by possibly replacing the existing ground water extraction and treatment system with monitored natural attenuation ("MNA") to complete the cleanup of the ground water to MCLs in Area 1 and Area 3 in conjunction with institutional controls ("ICs") (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) to ensure protection of human health and the environment. Specifically, the ICs would prevent the installation of any new ground water wells and/or ground water extraction from existing wells, as necessary, to prevent migration of the contaminant plume off the landfill property boundary.

WMPA, in coordination with EPA, implemented the following work to collect the information needed to support a remedy modification. The following activities were performed: (1) the installation of three (3) new monitoring wells, MW-13, MW-14, and MW-15 at the Site; (2) the execution of third quarter 1998 monitoring which included sampling of the ground water monitoring well network and performing annual surface water and sediment monitoring; (3) the identification of the required ground water usage restriction areas to ensure protection of human health.

On November 9, 1998, WMPA submitted the report entitled the "Alternative Ground Water Remedy Evaluation Report" which documented the results of the additional field work and compared the MNA/institutional control remedy to the existing pump and treat remedy as designed and implemented. For ease and consistency with accepted nomenclature, this report will be referred to as the Focused Remedial Investigation/Feasibility Study or "Focused RI/FS" in this ROD Amendment.

II. Findings of the Focused RI/FS

A review of ground water elevations at the Site reveals that ground water flow patterns generally follow surface topography. For Area 1, ground water flow from the landfilled areas is downslope from the hill on which Area 1 occurs resulting in flow to the northwest, southwest, and southeast directions toward inner portions of the Site. For the northeast section of Area 3, the other area which typically has had the highest levels of VOCs in ground water, ground water flow is generally in a radial type pattern from the top of the hill on which the Boser residence is located.

A total of 21 wells were sampled for the natural attenuation study as part of the Third Quarter 1998 sampling event at the Site (Figure 1). For Area 1 wells, as expected based on historical data, wells MW-5 (extraction well), PZ-3 (interior well) and RW-3 (extraction well) contained the highest levels of VOCs. Similarly, wells MW-11 (interior well) and MW-F (property boundary well) exhibited the lowest levels of VOCs. MCL exceedances occurred at RW-3 for 1,2-dichloroethane (7.1 ug/1) and vinyl chloride (5.2 ug/1). RW-3 is an extraction well located within the limits of the waste and therefore is not in the area of attainment. The only other exceedances for Area 1 were for 1,1,2-trichloroethane at PZ-3 (23 ug/1) and at MW-5 (6.2 ug/1).

For Area 3 wells, wells RW-2 (extraction well) and new well MW-14 (monitoring well) had the highest levels of VOCs. MCL exceedances occurred at RW-2 for tetrachloroethene (15 ug/1) and trichloroethene (8.5 ug/1). MCL exceedances occurred at MW-14, which is downgradient of RW-2, for tetrachloroethene (9.6 ug/1), trichloroethene (5.5 ug/1) and vinyl chloride (3.7 ug/1). MCL exceedances also occurred at MW-6 for tetrachloroethene (5.3 ug/1). MW-14 is the only monitoring well to exceed MCLs off-site. However, because the ground water flow is southwestward from MW-14, contaminated ground water flows from MW-14 back on-site near MW-6.

Following the Third Quarter 1998 ground water monitoring event and subsequent to the development of the Focused RI/FS, ground water monitoring wells were again sampled as part of the routine quarterly ground water monitoring at the Old City of York Landfill Site. The results for those VOCs that exceeded MCLs are presented in the table below:

	Fourth Quarter 1998				First Quarter 1999				Second Quarter 1999			
	MW-5	PZ-3	RW-3	RW-2	MW-5	PZ-3	RW-3	RW-2	MW-5	PZ-3	RW-3	RW-2
1,2 Dichloroethane			8.7				8.5				9.1	
Methylene Chloride		12								11		
Tetrachloroethene				19				12				13
Trichloroethene				9.1				7				5.9
1,1,2 Trichloroethane	5	16				5.9				17		
Vinyl Chloride			3.4				2.5				2.7	

all concentrations are in ug/l

Drinking water MCLs were not exceeded for any VOCs in monitoring wells MW-6 and MW-14 during the Fourth Quarter 1998, First Quarter 1999, or Second Quarter 1999 monitoring events. Sampling conducted during the Third Quarter 1999 monitoring event yielded results similar to those above.

In summary, the lateral extent of the detected VOCs is very limited in area. The sampling events determined that the concentration of VOCs in ground water at the Site are at relatively low levels, with the highest levels occurring in the samples from or near the extraction wells. Overall impacts of the extraction wells on ground water flow patterns is minor.

III. Verification of Natural Attenuation

A. Introduction

The term “monitored natural attenuation” (“MNA”) refers to the reliance on natural attenuation processes (within the context of a carefully controlled and monitored site cleanup approach) to achieve site-specific remediation objectives within a timeframe that is reasonable compared to that offered by other more active methods. The “natural attenuation processes” that are at work in such a remediation approach include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or ground water. These *in-situ* processes include biodegradation; dispersion; dilution; sorption; volatilization; radioactive decay; and chemical or biological stabilization, transformation, or destruction of contaminants.

Natural attenuation processes typically occur at all sites, but to varying degrees of effectiveness depending on the types and concentrations of contaminants present and the physical, chemical, and biological characteristics of the soil and ground water. Based on the

results of the analytical and geochemical data collected and summarized in the Focused RI/FS, it is EPA's opinion that biodegradation may not be the primary mechanism of natural attenuation at the Old City of York Landfill Site. EPA believes that other physical processes, mainly dilution and dispersion, may be the leading natural attenuation processes taking place at the Site.

B. Discussion

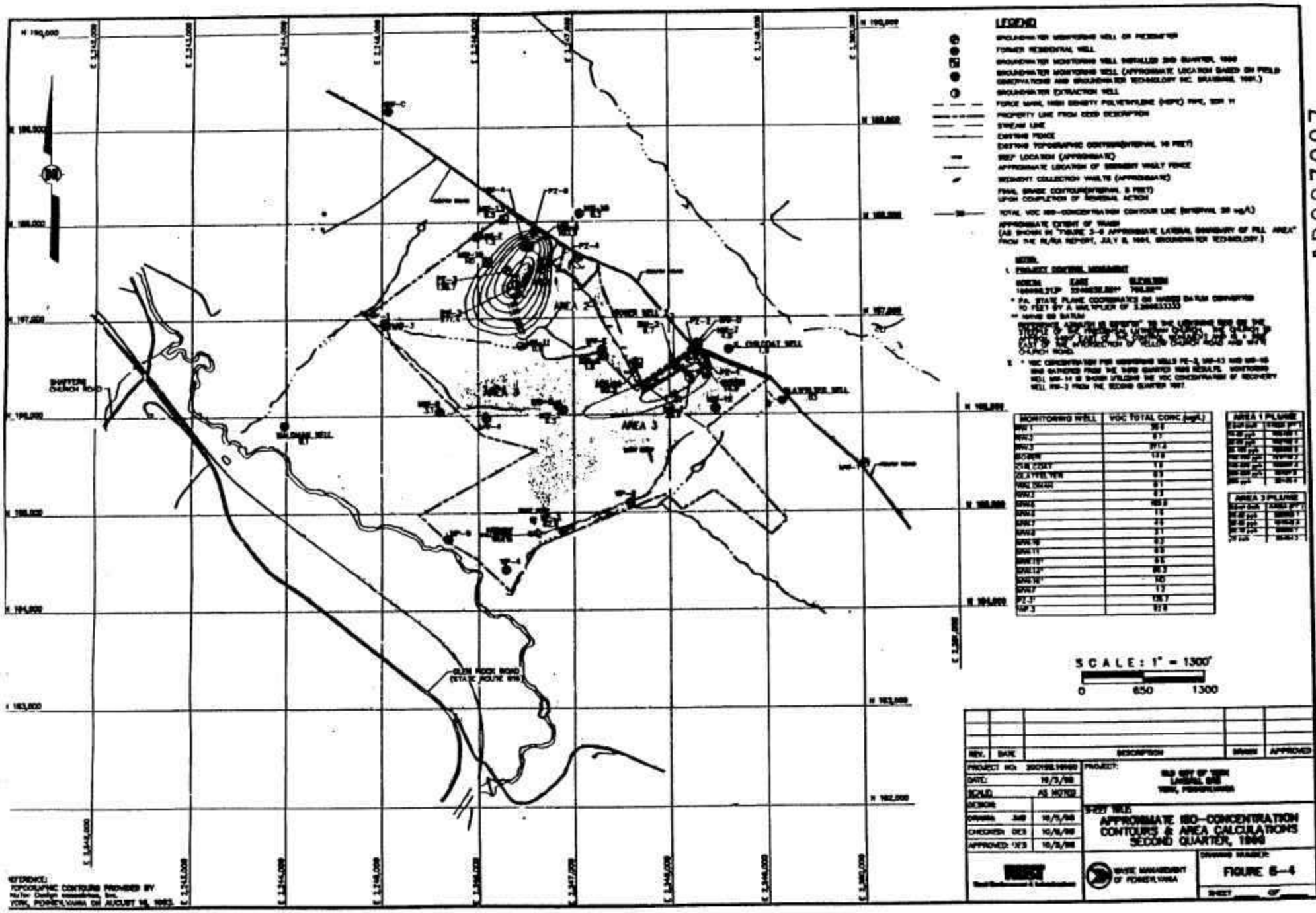
One of the lines of evidence that can be used to assess whether natural attenuation is occurring includes the review of historical ground water data that demonstrate a clear and meaningful trend of decreasing contaminant mass and/or concentration over time at appropriate monitoring and sampling points. Based upon the review of current and historical ground water data for the Old City of York Landfill Site, it is apparent that VOC concentrations on and off the property have decreased significantly over the monitored period.

Isoconcentration maps of total VOC concentrations based on data collected in May 1996 (prior to the commencement of the pump and treat system in June 1996) and August 1998 (representing existing site conditions) were constructed (See Figures 2 and 3). The two isoconcentration maps were used to calculate the contaminant mass during these two time frames, thus allowing for an estimate of total mass removal. A comparison of these isoconcentration maps for May 1996 and August 1998 reveal that the aerial extent of the VOC plume in Area 1 has significantly decreased. The VOC plume in Area 3 appears to have stabilized in dimension. The aerial extent of the plume in Area 3 also appears to have decreased, but not as significantly as the plume in Area 1.

An estimate of the mass of dissolved VOCs was made utilizing data from May 1996 and August 1998 and isoconcentration contours developed for the contaminant plumes at the Site. The total VOC mass in the subsurface at the Site was calculated to be approximately 85 pounds in May 1996 and approximately 61 pounds in August 1998. The decrease in VOC mass of 24 pounds in 27 months equates to a removal rate of approximately 11 pounds per year. In contrast, the estimated VOC recovery rate by the pump and treat system based on recorded pumping rate and corresponding VOC concentration at each of the five extraction wells was also calculated. Based upon this calculation, the total VOC recovery by the pump and treat system in 1997 including all five extraction wells was less than one pound. The discrepancy between the observed "mass of disappearance" and "mass recovered" is likely attributable to the processes of natural attenuation.

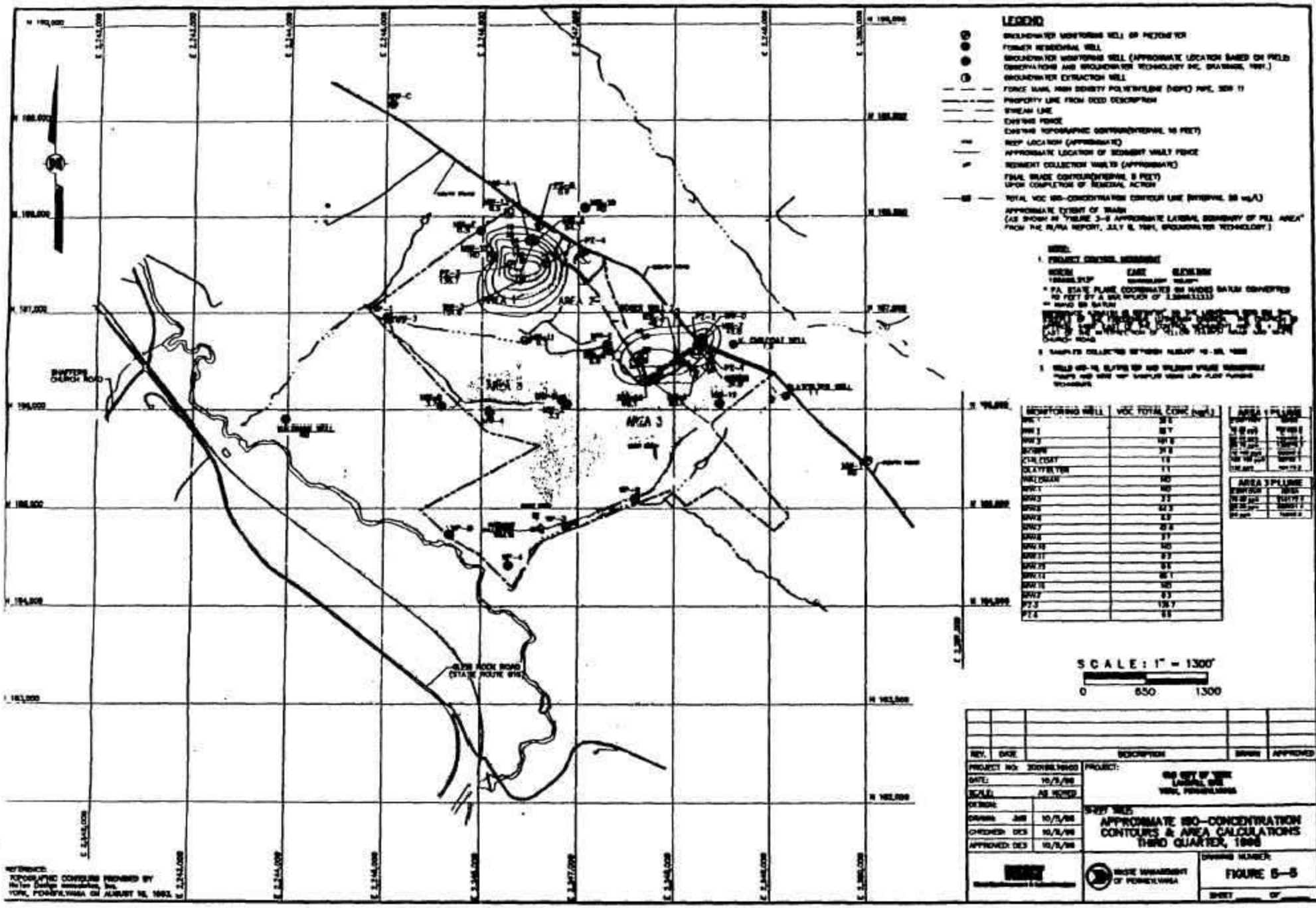
An empirical approach was used in assessing the decline in VOC concentrations within the recovery wells in Areas 1 and 3, respectively. Historical analytical data for the recovery wells, prior to and following commencement of the pump and treat system, was reviewed and indicated that the decline in concentrations of VOCs in MW-5 and RW-3 was apparent even before the start of ground water recovery. Ground water in the Boser well and RW-1 does not contain any VOCs above the MCL. However, historic VOC concentrations in the Boser well were previously much higher with a substantial decreasing trend occurring between 1983 and 1986 (from approximately 240 ug/l to 30 ug/l total VOCs). Total VOC levels at RW-1 have been low and

FIGURE 2



AR307007

FIGURE 3


LEGEND
AREA 3
AREA 3 PLUME
SCALE: 1" = 1300'
0
650
1300
APPROXIMATE ISO-CONCENTRATION CONTOURS & AREA CALCULATIONS THIRD QUARTER, 1998
FIGURE 5-5

fluctuate near 20 ug/l. The action of the ground water recovery system has not appeared to affect the detected concentrations in the Boser or RW-1 recovery wells. Concentrations in RW-2 appeared to be in decline before the commencement of the pump and treat system. A sudden increase in total VOC concentration was observed immediately after pumping started; it was followed by an immediate and significant decline. The sudden increase in total VOC concentration may be attributable to the induced hydraulic stress by the action of the pumping in RW-2 resulting in an influx of more contaminated water.

IV. Scope and Role of Response Actions

As discussed above, the current remedial action (ground water recovery and treatment) selected for the Site is only marginally effective. Estimates of the total VOC recovery by the pump and treat system, including all five recovery wells, indicates that less than one pound per year is being recovered compared to the loss of 11 pounds per year through natural attenuation processes. Continued operation of the existing pump and treat system adds little additional benefit toward remediation of the ground water to MCLs at the Old City of York Landfill Site.

VOC levels are overall at very low levels, particularly along the Site boundaries. The only exception is for the RW-2 and MW-14 area where MCLs are exceeded outside the Site boundaries. However, because ground water flow direction is southwestward from MW-14, the ground water from this area flows back toward the Site. Based on the very limited capture zones associated with the extraction wells, pumping of the extraction wells is not expected to significantly reduce off-property migration of VOCs.

V. Summary of Site Risks

A Risk Assessment (RA) is an analysis which estimates the potential risk to human health and the environment due to contamination of hazardous substances. It involves assessing the toxicity, or degree of hazard, posed by hazardous substances related to the Site, and describes the routes by which humans and the environment could come into contact with these substances. Separate calculations are made for substances that cause cancer (carcinogens) and for those that cause non-carcinogenic health effects.

Potential risks to human health were identified by calculating the risk level or hazard index for each chemical. Potential carcinogenic risks are identified by the risk level, 1.0E-06 level indicates one additional chance in 1,000,000 that an individual will develop cancer. The hazard index identifies the potential for the most sensitive individuals to be adversely affected by the noncarcinogenic chemicals. If the hazard index exceeds one (1.0), there may be concern for potential noncarcinogenic effects. As a rule, the greater the value of the hazard index above 1.0, the greater the level of concern.

In calculating the risks at the Site, the exposures evaluated assume much more extensive contact with the Site contaminants than is currently occurring, or is likely to occur in the future, and as such are very conservative. As part of the original RI/FS conducted in 1991, a Baseline

RA was conducted to estimate the human health and environmental risks that would be present if contamination at the Site was not remediated. The estimated Old City of York Landfill cancer risk in the Baseline RA associated with the hypothetical use of on-site ground water as a private water supply was 1×10^{-3} for the combined child/adult receptor. For the combined child/adult off-site receptor using ground water, the risk was estimated to be 1×10^{-4}. There were no unacceptable estimates of non-cancer health effects from exposure to Site-related constituents.

However, it is important to note that currently a public water line exists at the Site and Springfield Township established a construction moratorium in the vicinity of the Old City of York Landfill Site. This moratorium is consistent with the recommendation of PADEP (1982) to the Seven Valley Borough that new homes should not be built within a certain area in and around the Site. The moratorium does not specifically preclude the installation of wells. It does provide that any housing constructed in the moratorium area be connected to the public water supply line. Springfield Township has been enforcing the moratorium since 1982 and has not issued construction permits in the moratorium area unless the landowner was connected to the public water supply. The York Water Company supplies drinking water to residents in the vicinity of the Site, thus, there is an alternative water supply to residents in the area, precluding the use of local ground water. The water is supplied via a 4-inch line which runs along South Road. There is adequate capacity in the line to supply future residents along South Road with water, should such residential development occur.

In addition to the Springfield Township construction moratorium, a restrictive covenant has been placed on the Old City of York Landfill property by the owner to limit use of that property. The covenant states in part that (a complete copy of the covenant is in the administrative record file):

> *"No wells, ponds, impoundments or other structures or facilities for the recovery of ground water or surface water shall be constructed or used to recover water from on or beneath the Property for any purpose, including home, commercial, agricultural or industrial use, irrigation, cooling, or other use."*

As stated in the 1991 ROD, the only risk of concern at the Site is through the exposure to contaminated ground water. The risks associated with exposure to contaminated ground water at the Site have not substantially changed. Actual or threatened releases of hazardous substances from this Site, if not addressed by the remedial action selected in this ROD Amendment, present a current or potential threat to public health, welfare or the environment.

DESCRIPTION OF NEW ALTERNATIVES

The Superfund process requires that the alternative chosen to cleanup a hazardous waste site meet several criteria. The alternative must protect human health and the environment, be cost-effective, and meet the requirements of environmental regulations. Permanent solutions to contamination problems should be developed whenever possible. The solutions should reduce the volume, toxicity, or mobility of the contaminants. Emphasis is also placed on treating the

wastes at the site, whenever this is possible, and on applying innovative technologies to clean up the contaminants.

The Focused RI/FS studied monitored natural attenuation ("MNA") to see if MNA was applicable for addressing the contamination at the Site. The MNA alternative was then evaluated against the existing pump and treat system alternative selected in the 1991 ROD and a "No Further Action" alternative. These alternatives are presented and discussed below. All costs and implementation timeframes specified below are estimates:

Common Elements: All of the alternatives being considered would include common components. Each alternative would include the following: (1) the restrictive covenant would remain in place and would continue to prohibit uses that would pose a public health threat, and prevent the use or development of the surface water or ground water on or beneath the Old City of York Landfill property; (2) the public drinking water pipeline installed in 1986 to service residents would remain in place for all the alternatives: (3) a long-term (30-year) ground water monitoring program to measure concentrations of site-related contaminants over time; and (4) an EPA review of the Site every five years to ensure continued protection to human health and the environment for each of the alternatives.

Alternative 1: No Further Action

Capital Cost:	$0
Operation and Maintenance:	$160,699
Present Worth:	$739,710
Months to Implement:	0

The National Contingency Plan ("NCP"), EPA's regulations governing the Superfund program, requires that EPA consider a "No-Action" alternative at every site to establish a baseline for comparison with other alternatives that require action. Under this alternative, no remedial action would be taken at the Site. Since remedial actions have already been taken at the Site, a true "no-action" is not possible. The best approximation of a no-action alternative is ceasing current actions, that is removing the restrictive covenant for the Site and shutting off the public water supply. However, since these remedial actions will not cease, this alternative has been termed "no further action".

In this alternative, the public water line will remain in service and the restrictive covenant on the Old City of York Landfill property that is part of EPA's earlier ROD would continue to prohibit uses that would pose a public health threat, and prevent the use or development of the surface water or ground water on or beneath the property. The Site would be left in its current condition. A long-term (30-year) ground water monitoring program would be implemented at the Site using the existing wells. EPA would review the Site every five years in accordance with the requirements of CERCLA to assure continued protection to human health and the environment.

Alternative 2: Continue existing ground water recovery and treatment system in refuse Area #3 and Area #1, restore soil cover at refuse Area #3 (northeastern portion), ground water monitoring, vault sediment removal with off-site disposal

Capital Cost:	Not Applicable
Operation and Maintenance:	$223,644
Present Worth:	$2,050,061
Months to Implement:	Not Applicable

This alternative was selected as the remedial alternative in the 1991 ROD and has already been constructed and implemented. This alternative consisted of the restoration of the soil cover in the northeastern portion of refuse Area 3 to a two foot minimum, ground water recovery/treatment system in both Areas 1 and 3, a landfill gas extraction system, removal of contaminated sediments from on-site concrete leachate collection vaults, and a ground water monitoring program. In addition, this alternative included a perimeter fence at the leachate collection vaults to prevent public access, and a surface water/sediment monitoring program for the leachate seeps and tributaries on-site to ensure continued protection to human health and the environment.

Alternative 3: Monitored Natural Attenuation with Institutional Controls in both Area 1 and Area 3

Capital Cost:	Not Applicable
Operation and Maintenance:	$200,755
Present Worth:	$1,538,049
Months to Implement:	Not Applicable

For this alternative, a long-term monitoring program would be required to verify that natural attenuation will meet the remedial standards of achieving MCLs in ground water (i.e., that VOC levels are decreasing as anticipated as a result of natural attenuation) and to trigger a contingent remedy to restart the existing pump and treat system remedy in the event that the monitoring results reveal that the plume is significantly expanding or natural attenuation processes are not protective of human health and the environment. Should a contingent remedy be triggered, an ESD or ROD Amendment would be required. The monitoring program will consist of 30 years of quarterly sampling with potentially reduced frequency for some or all of the monitoring wells to semiannual or annual thereafter based upon statistical evaluation of the first 8 quarters of data. In the event that the statistical evaluation of the first two years of data indicate that natural attenuation processes continue to reduce the plume with no evidence of migration of VOCs, EPA may reduce the sampling frequency to semi-annual or annual.

The statistical analysis method and approach will be outlined in the Operation and Maintenance ("O&M") Plan for the Site. The exact wells which will be utilized to monitor the natural attenuation processes will be determined in the operation and maintenance ("O&M")

plan. Following the statistical evaluation of ground water data, if the data indicates that the plume has significantly expanded and VOCs migrate off-property at levels that are not protective of human health or the environment, or natural attenuation processes are not protective to human health and the environment, a contingency measure, including restarting the existing pump and treat system, will be implemented.

To reduce the potential for human exposure to ground water contamination due to the Site, institutional controls (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) shall be established. Specifically, the institutional controls would include ground water extraction controls implemented on individual properties, as necessary, to prohibit or restrict ground water use within the immediate Site vicinity in order to prevent migration of the existing plume. Also, the implementation of institutional controls may also prohibit the installation of any new wells, as necessary, to ensure that contaminated ground water is not inadvertently drawn off the property boundary and contaminate previously uncontaminated areas. An evaluation of York County and Springfield Township long-term plans will be evaluated for the area, and ground water modeling will be conducted to determine which, if any, properties will require the aforementioned institutional controls (Figure 4 presents a conceptual schematic of those residential properties which may require these institutional controls).

EVALUATION OF ALTERNATIVES

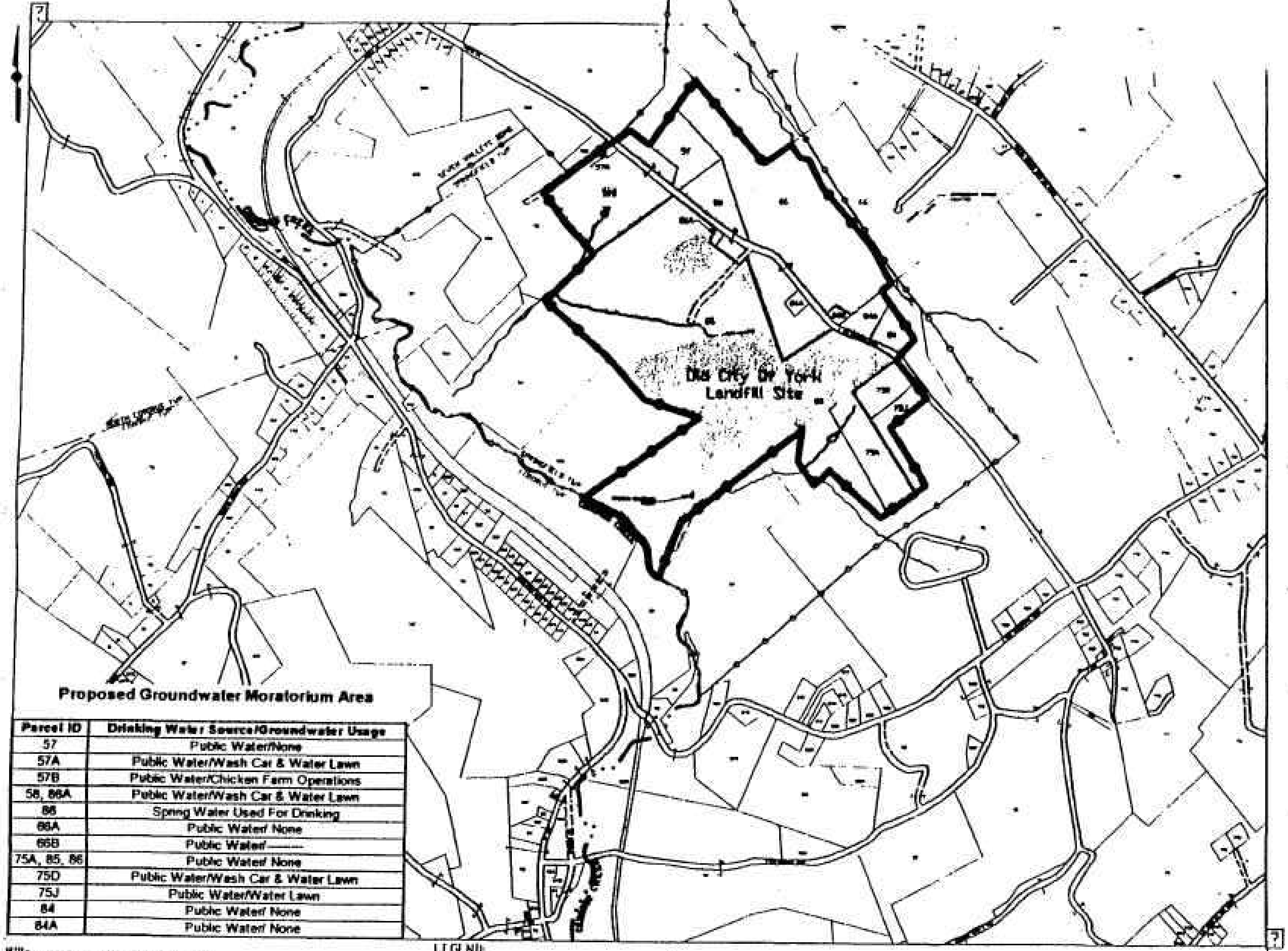
A detailed analysis was performed on the alternatives using the nine evaluation criteria specified in the NCP in order to select a remedy. The following is a summary of the comparison of each alternatives' strength and weaknesses with respect to the nine evaluation criteria. These nine evaluation criteria are listed and described in Exhibit A.

A. Overall Protection of Human Health and the Environment

Alternative 1 (No Further Action) would be least protective of human health and the environment since this alternative does not actively address reducing or controlling contamination at the Site. Both Alternatives 2 and 3 are considered protective of human health and the environment. Alternative 2 would reduce the risk to human health from exposure to contaminated ground water through ground water recovery and treatment. Alternative 3 would eliminate/decrease the existing ground water contamination through natural attenuation processes. Ground water is not utilized for drinking water purposes on the Site and a restrictive covenant on the Boser property prohibits future use of the ground water for drinking water and other purposes. Also under Alternative 3, to reduce the potential for human exposure to contamination due to the Site, institutional controls (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) shall be implemented on individual properties, as necessary, to prohibit or restrict ground water use from existing ground water wells within the immediate Site vicinity in order to prevent migration of the existing plume. The institutional controls may also prohibit the installation of any new ground water wells, as necessary, to ensure that contaminated ground water is not inadvertently drawn off the property boundary resulting in contamination of previously uncontaminated areas.

FIGURE 4

AR307014



Proposed Groundwater Moratorium Area

Parcel ID	Drinking Water Source/Groundwater Usage
57	Public Water/None
57A	Public Water/Wash Car & Water Lawn
57B	Public Water/Chicken Farm Operations
58, 86A	Public Water/Wash Car & Water Lawn
86	Spring Water Used For Drinking
66A	Public Water/ None
66B	Public Water/ ------
75A, 85, 86	Public Water/ None
75D	Public Water/Wash Car & Water Lawn
75J	Public Water/Water Lawn
84	Public Water/ None
84A	Public Water/ None

EARTH TECH

WASTE MANAGEMENT OF PA
OLD CITY OF YORK LANDFILL SITE
YORK COUNTY, PENNSYLVANIA

PROPOSED GROUNDWATER USAGE MORATORIUM AREA

EXHIBIT A

ALTERNATIVE EVALUATION CRITERIA

Overall Protection of Human Health and the Environment - Addresses whether the remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls or institutional controls.

Compliance with ARARs - Refers to whether or not a remedy will meet all Applicable or Relevant and Appropriate Requirements (ARARs) of federal and state environmental statues and/or provides grounds for invoking a waiver.

Long-Term Effectiveness and Permanence - The ability of the remedy to maintain reliable protection of human health and the environment over time once the "clean-up" goals have been met.

Reduction of Toxicity, Mobility or Volume Through Treatment - Relates to the anticipated performance of the treatment technologies with respect to these criteria.

Short-Term Effectiveness - Refers to the period of time needed to achieve protection, and any adverse impacts on human health and the environment that may be posed during the construction and implementation, until clean-up goals are achieved.

Implementability - The technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

Cost - The following costs are evaluated: estimated capital, operation and maintenance, and net present worth.

State Acceptance - This indicates whether, based on its review of the Feasibility Study and the Proposed Plan, the State concurs with, opposes, or has no comment regarding the preferred alternative.

Community Acceptance - Will be assessed in the Record of Decision following a review of the public comments received on the Administrative Record and the Proposed Plan.

VOC levels are overall at very low levels, particularly along the Site boundaries. The only exception is for the RW-2 and MW-14 area where MCLs are exceeded outside the Site boundaries. However, because ground water flow direction is southwestward from MW-14, the ground water from this area flows back toward the Site. Based on the very limited capture zones associated with the extraction wells already in place under Alternative 2, pumping of the extraction wells is not expected to significantly reduce migration of VOCs.

B. Compliance with ARARS

Any cleanup alternative EPA considers must comply with all applicable or relevant and appropriate federal and state environmental requirements ("ARARs"). *Applicable* requirements are those substantive environmental standards, requirements, criteria, or limitations promulgated under federal or state law that are legally applicable to the remedial action to be implemented at the Site. *Relevant and Appropriate* requirements, while not being directly applicable, address problems or situations sufficiently similar to those encountered at the Site that their use is well suited to the particular Site.

The current ARAR for ground water consists of achieving drinking water maximum contaminant levels ("MCLs") in the area of attainment for the VOCs identified in Table 29 of the existing ROD (Table 1 of this ROD Amendment). Those VOCs are the contaminants of concern, ("COC"). MCLs are promulgated under the Safe Drinking Water Act, 42 U.S.C. §§ 300 f to 300 j-26, and its implementing regulations at 40 C.F.R. Part 141.61 (the original ARAR in the ROD was Pennsylvania's "background" levels for those parameters listed in Table 29 of the 1991 ROD; however, on September 27, 1996, EPA issued an Explanation of Significant Differences ("ESD") which changed the ARAR to MCLs.). The ARARs in the present ROD are those set forth at 40 C.F.R. Part 141.61 for those contaminants listed in Table 1 of this ROD Amendment. PADEP has identified the Land Recycling and Environmental Remediation Standards Act (Act 2), and its implementing regulations at 25 PA Code Chapter 250, Administration of the Land Recycling Program, as ARARs for this remedy. EPA has determined that Act 2 does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the federal standard.

After approximately 3 years of operation of the ground water pump and treat system under Alternative 2, this ARAR has not been achieved. Overall, exceedances of MCLs in the area of attainment are limited to a few wells. An evaluation of historic trends of VOC levels in key wells, indicates that ground water pump and treat has not significantly affected trends (i.e., resulted in decreasing VOC levels).

Based on existing results and the limited capture zones achievable because of the low yielding anisotropic nature of the aquifer, ground water extraction and treatment is not considered to be more likely to achieve MCLs than Alternative 3. Alternative 3, Monitored Natural Attenuation, is capable of achieving MCLs in ground water virtually within the same time period as Alternative 2. As stated previously, active pump and treat removes approximately only an additional pound of VOCs compared to the 11 pounds lost through natural attenuation processes.

TABLE 1[1]

REQUIRED REMEDIATION LEVELS FOR GROUND WATER

COMPOUND[2]	REQUIRED CONCENTRATION (UG/L)	
	VALUE	BASIS
BENZENE	5	MCL
1,4-DICHLOROBENZENE	75	MCL
1,2-DICHLOROETHANE	5	MCL
1,1-DICHLOROETHENE	7	MCL
METHYLENE CHLORIDE	5	MCL
TETRACHLOROETHENE	5	MCL
1,1,2-TRICHLOROETHANE	5	MCL
TRICHLOROETHENE	5	MCL
VINYL CHLORIDE	2	MCL

NOTES

(1) Based, in part, on Table 29 of the Record of Decision dated September 30, 1991. Original Table 29 MCL value for methylene chloride has been revised.

(2) Includes all chemicals evaluated for ground water exposure risks at the Old City of York Landfill Site.

The "No Further Action" alternative would not meet ARARs. Furthermore, since Alternative 1, No Further Action, does not meet the threshold criteria of overall protection of human health and the environment and compliance with ARARs, it will not be considered further in this analysis.

C. Long-term Effectiveness and Permanence

Both Alternatives 2 and 3 would provide essentially equal levels of long-term effectiveness and permanence by reducing the concentrations of contaminants in ground water. The difference between the alternatives with regard to the long-term effectiveness and permanence is directly related to how each alternative addresses ground water contamination at the Site (i.e., active ground water extraction and treatment, Alternative 2, or monitored natural attenuation, Alternative 3). Alternative 2 has the potential to meet MCLs marginally faster than Alternative 3 because it is an active cleanup process. The cleanup time for ground water, however, is not crucial, because a water line exists at the Site, and the existing and proposed ground water extraction controls will prevent further contact with contaminated ground water.

During and upon completion of Alternative 2, ground water extraction and treatment, residual waste in the form of carbon from the stripper off-gas treatment and sediment in the bottom of the equalization tank would need to be managed. Such residual waste will not need to be managed for Alternative 3.

For each alternative, ground water monitoring would be conducted to identify progress in achieving remediation standards and after remediation standards have been achieved to ensure the permanence of the selected alternative.

D. Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 2 would not reduce the toxicity of the contaminants in the aquifer but would affect their mobility near the wells through hydraulic containment and slightly decreased contaminant volume through extraction. However, the mass removal of VOCs achieved by the extraction wells to date is extremely low typically ranging from approximately 0.003 pounds per quarter for RW-1 to approximately 0.2 pounds per quarter for RW-3.

Alternative 3 relies on the processes of natural attenuation to reduce the mobility of the contaminants present in the ground water. To monitor the rate of natural attenuation and the fate of the contaminants, Alternative 3 will utilize the results of ground water sampling and analysis, which was conducted at the Site to specifically investigate natural attenuation processes. The volume of the contamination will also be reduced by the natural attenuation processes.

E. Short-term Effectiveness

The ground water extraction and treatment system under Alternative 2 has been in operation

since June 1996. Because the system already exists, human health and environmental risks related to its construction are not relevant. However, minimal worker risks associated with routine operation and maintenance of the system may occur.

For monitored natural attenuation, Alternative 3, there are acceptable risks associated with its implementation because of the very low level of contaminants. Worker risks associated with monitoring well sampling may occur but are expected to be minimal based upon level of contamination and duration of activity. Based on ground water flow patterns, the distribution of VOCs in ground water and their low levels, the potential for further migration of contamination outside the Site property while natural attenuation proceeds is minimal.

F. Implementability

Alternative 2, ground water extraction and treatment, is already constructed and operating, therefore implementability issues associated with its construction are not pertinent. In terms of operation, the system has proven dependable to date. Since the ground water treatment system is based on proven technologies, no significant technical difficulties are anticipated with its ongoing operation.

Alternative 3, monitored natural attenuation with institutional control remedy would not require any construction. As discussed previously, the restrictive covenant is already in place for the landfill property itself. Any institutional controls restricting ground water use within the Site vicinity necessary to prevent the migration of the existing plume and reduce the potential for human exposure to contamination are expected to be obtainable. Alternative 3 would require a ground water monitoring well network which is already in place.

G. Cost

A comparison of capital costs for Alternative 2 and Alternative 3 is not relevant because the ground water extraction and treatment system is already constructed and no new construction is required for the monitored natural attenuation with institutional control remedy. Therefore, this evaluation considers only estimated O&M and monitoring costs from 1999 through the anticipated end of remedial action in 2025.

The total net present worth (“NPW”) cost for Alternative 2 is $2,050,061. The NPW cost for Alternative 3 is $1,538,049. The NPW costs for both alternatives are approximations. Detailed cost breakdowns for each of the alternatives are available in the Administrative Record.

H. State Acceptance

The Commonwealth of Pennsylvania has concurred with the selected remedy described in this ROD Amendment.

I. Community Acceptance

EPA has considered the comments received during the public comment period on its preferred remedial alternative presented in the Proposed Plan. These comments are summarized and responses are provided in the Responsiveness Summary portion of this ROD Amendment.

DESCRIPTION OF THE SELECTED REMEDY

Based upon consideration of the information available for the Old City of York Landfill Site, including the documents available in the administrative record file, an evaluation of the risks currently posed by the Site, the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, EPA has selected Alternative 3, Monitored Natural Attenuation with Institutional Controls in both Area 1 and Area 3, as the revised selected remedy for the Old City of York Landfill Site.

For this alternative, a long-term monitoring program would be required to verify that natural attenuation will meet the remedial standards of achieving MCLs in ground water (i.e., that VOC levels are decreasing as anticipated as a result of natural attenuation) and to trigger a contingent remedy to restart the existing pump and treat system remedy in the event that the monitoring results reveal that the plume is significantly expanding or natural attenuation processes are not protective of human health and the environment. Should a contingent remedy be triggered, an ESD or ROD Amendment would be required. Alternative 3 meets the threshold criteria of overall protection of human health and the environment and compliance with ARARs. In considering the balancing criteria, EPA believes Alternative 3 is easily implemented, achieves long-term effectiveness and permanence at a reasonable cost, minimizes the short-term impacts, and effectively reduces the mobility of Site contaminants.

Furthermore, concentrations of contaminants in ground water are at low levels. The alternate remedy selected in this ROD Amendment will not require the contaminated ground water to be actively remediated through the existing pump and treat system. Instead, the remediation of the aquifer to MCLs will be allowed to take place through natural attenuation processes.

The requirements for implementing Alternative 3 are as follows:

A. Natural Attenuation Requirements

(1) Natural attenuation processes shall be allowed to reduce the concentrations of VOC contaminants in the ground water at the Site to levels that protect human health and the environment. EPA has determined that the appropriate cleanup levels for the contaminants in the ground water shall be drinking water maximum contaminant levels (“MCLs”) as referenced in Table 29 of the 1991 ROD with one modification. The cleanup level referenced for methylene chloride in Table 29 of the 1991 ROD is 11 ug/l. This cleanup level for methylene chloride is a risk-based remediation level as established in the original RI/FS. Since the issuance of the 1991 ROD, EPA has established an MCL

of 5 ug/l for methylene chloride. (Table 1 of this ROD Amendment reiterates the appropriate VOC cleanup levels with the methylene chloride modification).

(2) A statistical evaluation of the monitoring data shall be performed every two years, unless EPA determines that more frequent analysis is required, to determine the rate at which natural attenuation processes are reducing VOC levels at this Site.

B. Monitoring Requirements

(1) Monitoring shall be performed to measure changes in contaminant concentrations in the ground water plume at the Site until the cleanup levels have been achieved. The exact location and number of ground water monitoring points shall be determined by EPA, in consultation with PADEP, during the preparation of the Operation and Maintenance Plan for the Old City of York Landfill Site.

(2) Samples shall be collected from the monitoring points on a quarterly basis for up to 30 years. Samples shall be collected and analyzed for VOCs.

(3) If EPA determines that a statistical evaluation of the ground water data collected for the first eight quarters of the monitoring program demonstrates that natural attenuation processes are reducing the contaminant concentration at a reasonable rate and that the contaminants are not significantly migrating, EPA may reduce the frequency of sample collection and may limit the scope of analysis required. In the event that the statistical evaluation of the first two years of data indicate that natural attenuation processes continue to reduce the plume with no evidence of migration of VOCs, EPA may reduce the sampling frequency to semi-annual or annual. If EPA determines that contaminant levels are not decreasing at a reasonable rate or that significant contaminant migration is occurring, EPA may increase the frequency of sample collection, may require additional analysis, or trigger the contingent remedy to restart the pump and treat system. Should the contingent remedy be triggered, an ESD or ROD Amendment would be required.

C. Institutional Controls

(1) Institutional controls (e.g., easements and covenants, title notices and land use restrictions through agreements or orders) shall be implemented on individual properties, as necessary, to prohibit or restrict ground water extraction from existing ground water wells within the immediate Site vicinity in order to prevent migration of the existing plume. The institutional controls may also prohibit the installation of any new wells, as necessary, to ensure that contaminated ground water is not inadvertently drawn off the property boundary and resulting in contamination of previously uncontaminated areas. An evaluation of York County and Springfield Township long-term plans will be evaluated for the area and ground water modeling will be conducted to determine which, if any, properties will require the aforementioned institutional controls.

(2) The Restrictive Covenant that is currently in place on the landfill property shall remain in effect.

STATUTORY DETERMINATIONS

This remedy satisfies the remedy selection requirements of CERCLA and the NCP. The remedy is expected to be protective of human health and the environment, complies with ARARs, is cost effective, and utilizes permanent solutions. The remedy does not include treatment as a principal element of the remedy because natural attenuation processes can reduce contaminant concentrations to levels that protect human health and the environment within a reasonable time frame. Additionally, once the institutional controls are implemented there will be no risk of direct exposure to the Site-related contaminants. The following is a discussion of how the selected remedial action addresses the statutory requirements.

A. Overall Protection of Human Health and the Environment

The selected remedy will provide adequate protection of human health and the environment by allowing natural attenuation processes to reduce the contamination in the ground water. This action will reduce the carcinogenic risk from exposure to contaminated ground water through the implementation of institutional controls.

B. Compliance with Applicable or Relevant and Appropriate Requirements ("ARARS")

The selected remedy will comply with the Safe Drinking Water Act, 42 U.S.C. §§ 300 f to 300 j-26, and its implementing regulations at 40 C.F.R. Part 141.61 with respect to meeting drinking water MCLs. PADEP has identified Act 2 as an ARAR for this remedy; EPA has determined that Act 2 does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the federal standard.

C. Cost Effectiveness

EPA has determined that the selected remedy most effectively addresses contaminated ground water while minimizing costs. The estimated present worth cost is $1,538,049. The existing ground water extraction system, while not significantly more expensive, only provides marginal additional benefit toward remediation of ground water to MCLs at the Site.

D. Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a cost-effective manner at the Site. The selected remedy does not require treatment because the current remedy

(ground water extraction and treatment) achieves only marginal additional protection for additional cost.

E. Preference for Treatment as a Principal Element

As stated above, the selected remedy does not require treatment because the current remedy (ground water extraction and treatment) achieves only marginal additional protection for approximately $500,000 in additional costs.

RESPONSIVENESS SUMMARY
OLD CITY OF YORK LANDFILL SITE
SPRINGFIELD TOWNSHIP, PENNSYLVANIA

This community relations responsiveness summary is divided into the following sections:

SECTION I: Overview: This section discusses EPA's selected remedy for the Old City of York Landfill Site.

SECTION II: Background: This section provides a brief history of community interest and concerns raised during remedial response at the Old City of York Landfill Site.

SECTION III: Summary of Commentors' Major Issues and Concerns: This section provides a summary of commentors' major issues and concerns, and expressly acknowledges and responds to those raised by the local community. "Local community" may include local homeowners, businesses, the municipality, and not infrequently, potentially responsible parties (PRPs).

I. OVERVIEW

In September 1999, EPA announced the public comment period and published its preferred alternative for the Old City of York Landfill Site, located in Springfield Township, York County, Pennsylvania. EPA screened three possible alternatives for the continued remediation of site contamination. EPA carefully considered state and community acceptance prior to reaching its final decision regarding amending the current remedy. The Agency's revised remedy is Monitored Natural Attenuation with Institutional Controls in both Area 1 and Area 3. This alternative satisfies the key criteria for remedy selection and minimizes the need for long-term treatment and management.

II. BACKGROUND

Community interest and concern about the Site has been steady throughout EPA involvement. To obtain public input on the Proposed Remedial Action Plan (Proposed Plan or PRAP), EPA held a public comment period from September 10, 1999 to October 12, 1999. EPA also held a public meeting on September 21, 1999. Those in attendance at the meeting included local area residents, state officials, news media representatives, representatives from EPA, and representatives from companies interested in the Site activities and cleanup decisions.

Public notification of the September 21, 1999 meeting was issued to local media and to area

residents and Federal, state, and local officials on EPA's Site mailing list. EPA announced the opening of the public comment period in a newspaper display ad placed in the September 10, 1999 edition of the *York Daily Record and Hanover Evening Sun*.

In addition, EPA established a Site information repository at the Village Library in Jacobus, Pennsylvania. The repository contains the Community Relations Plan, the Focused RI/FS Report, the PRAP, and EPA's Administrative Record File for the Site, which encompasses the key documents the Agency uses in selecting the Site remedy.

III. SUMMARY OF COMMENTORS' MAJOR ISSUES AND CONCERNS

This section provides a summary of commentors' major issues and concerns, and expressly acknowledges and responds to those raised by the local community. The major issues and concerns on the proposed remedy for the Old City of York Landfill Site received at the public meeting on September 21, 1999, and during the public comment period, can be grouped into the following categories:

A. Comments Submitted by the Local Community
B. Comments Submitted by Springfield Township
C. Comments Submitted by Potentially Responsible Parties
D. Comments Submitted by the Commonwealth of Pennsylvania

The questions, comments, and responses are summarized as follows:

A. <u>Comments Submitted by the Local Community</u>

1. A local resident raised concerns regarding local residents' ability to eventually sell their homes adjacent to the Old City of York Landfill Site and if EPA would provide any financial assistance should property values be decreased because of the presence of the landfill.

   EPA Response: Unfortunately, EPA cannot provide any financial assistance to homeowners to compensate them for decreased property values as a result of the presence of the landfill. EPA may consider paying damages to residents only if an adjacent homeowners uncontaminated property would be unavoidably and directly impacted by the remedial activities taking place during a cleanup of a Superfund Site. This was not the case at the Old City of York Landfill Site since all construction activities occurred within the Site boundary.

2. A couple of months ago we had a meeting in Springfield Township where you had wanted us to put these restrictions on. Has that now fallen by the wayside?

   EPA Response: On July 8, 1999 EPA and Waste Management, Inc. ("WMI") met with local residents to discuss the proposed changes to the remedy that were being

contemplated. This was done in advance of issuing the Proposed Remedial Action Plan to get a sense of local community reaction to establishing institutional controls on individual properties within the vicinity of the Old City of York Landfill Site. Although one or two residents voiced objections, EPA believed the majority of the residents were not opposed.

3. Everyone can agree that the volatile organic compounds (VOCs) found in the landfill can be cancer causing at very low levels. This was poorly discussed in the Proposed Plan. The "Summary of Site Risks" is limited to the risk of drinking the ground water. There are other pathways for the chemicals to enter our bodies.

EPA Response: The risks associated with VOCs at the Site were not discussed in detail in the Proposed Plan because they were discussed in detail in the *"Final Revised Remedial Investigation and Risk Assessment Report* " dated July 8, 1991, and the original Record of Decision (ROD) dated September 30, 1991. In EPA's opinion, the baseline risks at the Site have not substantially changed. Based on the baseline risk assessment, the individual exposure pathway associated with the largest, theoretical, upper-bound, incremental cancer risk was exposure to on-site ground water. Exposure to on-site ground water included the following exposure pathways: (1) inhalation of vapor during showering; (2) dermal contact with ground water during showering; and (3) ingestion of ground water. In addition to exposure to ground water, dermal contact and incidental ingestion of surface soil, and inhalation of dust were also evaluated. The latter exposure pathways were determined not to pose an unacceptable risk.

4. We, as humans, come into contact with a lot of chemicals (i.e., in the water, the air, on the land [60 million birds die each year in the U.S. from insecticide poisoning] and in the food we consume) that are detrimental to our health. All of these may be at low levels but the cumulative affect is not discussed.

EPA Response: The purpose of the baseline risk assessment is to assess the incremental cancer risk a person may be subject to from exposure to Site-related contaminants assuming no further action is taken to address the contamination. It would be extremely difficult to assess the cumulative affects associated with exposure to contaminants at a Superfund Site and exposure to other contaminants associated with everyday daily activities. Such an evaluation would be different for every individual dependent upon occupation, lifestyle, etc., and be subject to many uncertainties. In order to develop a strategy to assess risks posed by contaminants at Superfund sites standardized methodologies are used to calculate cumulative risks for different exposure pathways and site-specific chemicals associated with the Site. These pathways are then combined to determine what the cumulative risk may be to an individual.

5. Any reduction in the amount of our exposure to harmful chemicals is warranted. Alternative 2 is the only alternative that physically removes the hazardous materials. It is for this reason that I support Alternative 2 over Alternative 3.

EPA Response: The current remedy, ground water extraction and treatment, does remove contaminants from the aquifer. However, since the concentration of contaminants in the aquifer are so low, it does not do so efficiently. As discussed in the ROD Amendment, natural attenuation processes appear to be much more effective in reducing contamination at the Site with an equal ability to achieve the eventual cleanup of the ground water to drinking water maximum contaminant levels (MCLs). Continued operation of the existing pump and treat system is not practical for such a marginal return in benefit.

6. What is EPA's position on technologies that use bacteria to cleanup ground water pollution. (an article about the use of bacteria in Australia to cleanup ground water was enclosed).

EPA Response: Bioremediation of ground water can be an effective remedy for certain sites. Typically, one of the primary factors of natural attenuation, such as the remedy EPA is selecting in this ROD Amendment, is the biodegradation of contaminants with naturally occurring bacteria found in the subsurface soils. Unfortunately, at the Old City of York Landfill Site, the conditions are not entirely conducive for biodegradation to be the primary natural attenuation process occurring at the Site. Rather, EPA believes that dilution and dispersion are the primary natural attenuation processes at work at the Site.

7. The term "cost-effective" is a great tool of management/accounting and it is a scary one. It makes you wonder whether Congress withheld funds for use for one of their pork barrel projects or did the lobbyists win - Waste Management being one.

EPA Response: EPA is mandated by the Superfund process to consider the cost-effectiveness of all Superfund remedies. Cost-effectiveness is determined by evaluating the following three of the five balancing criteria during the evaluation of the nine criteria as presented in Exhibit A of the ROD Amendment: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; and short-term effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost-effective. A remedy is cost effective if its costs are proportional to its overall effectiveness. Cost-effectiveness is concerned with the reasonableness of the relationship between the effectiveness afforded by each alternative and its costs compared to other available options.

8. The EPA doesn't really believe that there are only twelve pounds of contaminants in the site per year, does it? What about all the contaminants that were dumped there since 1961 ? Where did they go? Does EPA know the relationship between the water passing through the Site and its effect on the aquifer? What proof does EPA have that quantities of carcinogens aren't passing into the aquifer? How deep is the aquifer? How many test wells were made on the 56 plus acres in order to gather data for cost analysis? A couple? How deep are the wells, 25 feet or so? Have you sought any independent advice on this? I would guess not. I find it hard to believe that the landfill is clean even though it was on the Superfund List - of which the lawyers got most of the money.

EPA Response: The Old City of York Landfill Site has been studied for approximately the past twenty years. This includes study by the PRPs and their consultants, PADEP, technical experts at EPA, and independent contractors hired by EPA. The relationship between the landfill and the aquifer is well established. There are a total of 34 wells on and off the landfill property that have been monitored during the Site's history not including a substantial number of residential wells in the Site area. The wells range in depth from 15 feet to 250 feet in depth. This information is contained in the "*Final Revised Remedial Investigation and Risk Assessment Report* " dated July 8, 1991, and several other technical documents that were subsequently developed and which are contained in the administrative record file.

EPA has never said the Old City of York Landfill Site is clean. Obviously, the presence of VOCs above their respective MCLs is an indication that the Site is not clean. The estimation that 12 pounds of VOCs are being removed per year through natural attenuation process is just that, an estimation. This estimation is based upon knowledge of the aquifer characteristics and monitoring data from wells at the Site. The point that EPA is trying to make is that three years of operation of the pump and treat system reveals that the system is only marginally effective and provides little additional benefit to the eventual cleanup of this Site over the natural processes currently taking place in the aquifer itself

B. Comments Submited by Springfield Township

General Comment

The comments are based on review of the document entitled "*Alternative Ground water Remedy Evaluation Report*" (the **"Report"**) dated November 1998 prepared by RUST Environment & Infrastructure on behalf of Waste Management, Inc. ("WMI"), review of the public record for the Site, evaluation of past monitoring data, and discussions with representatives of the Environmental Protection Agency Region III ("EPA") and WMI. The Township does not support WMI's alternative plan at this time.

The Township does not believe that WMI has shown that natural attenuation is capable of achieving remediation goals at the Site.

The Township voices strong opposition to any plan that includes removal of the existing ground water recovery system. The Township fears tear-down of the ground water recovery system would remove an important safety option that may be needed for the protection of Township residents.

The Township feels the alternative plan requires institutional controls that are too strict and could trigger takings claims which the Township could be forced to defend.

Therefore the Township **voices** strong opposition to any plan that includes Township enforced zoning ordinances as an institutional control.

The Township voices strong opposition to any plan that abandons clean wells and useable land as an end goal of remediation.

The Township has reviewed the most recent monitoring results and feels the results are consistent with the views expressed in these comments.

EPA Response: EPA acknowledges and has considered the above statements made by the Township. The Township's specific comments are addressed by EPA below.

Comments to "Alternative Ground Water Remedy Evaluation Reports"

1. Monitoring, extraction, and residential wells are spread throughout the Site providing adequate monitoring data. The Township questions the lack of monitoring wells ("MW") between the northeast of Area 3 and the east and west seeps since this is the steepest gradient and likely the strongest flowpath for ground water.

   EPA Response: The area between the northeast section of Area 3 and the east and west seeps consists mostly of landfilled areas. Ground water cleanup efforts are focused on ground water quality outside the waste boundary areas where exposures may occur and not directly beneath the landfilled areas. Therefore, monitoring wells are not necessarily needed between the northeast section of Area 3 and the east and west seeps since they would only provide information on ground water quality beneath the landfill mass. Sampling of the east and west seeps provides adequate data to assess impacts outside the waste boundary downgradient of Area 3. Other monitoring wells are located southwest of Area 3 and downgradient of the east and west seeps. Specifically, these are well points WP-2, -3, and 4. The well points were designed as piezometers to monitor shallow ground water in the vicintiy of probable discharge areas. The depth of the well points varied from 15 to 40 feet depending on the depth in which ground water was encountered during drilling. Sampling and analyses of these well points during the original remedial investigation conducted from 1987 to 1991 revealed very low VOC contamination with no single VOC above its respective MCL. In addition, the east and west seeps which also are local shallow ground water discharge points were sampled and continue to be sampled for inorganics. The seeps are no longer sampled for VOCs since historically, VOCs have not been found to be a problem with the seeps.

2. The Township finds the sampling and laboratory analyses appropriate. The Township draws attention to the discrepancy that occurs where laboratory reporting limits (thresholds) are above corresponding MCLS, AWQCS, or ER-M. The Township understands this may not be a correctable deficiency. However, at several places the report draws conclusions from results in this range of unsubstantiated data and the Township feels this is probably not appropriate.

   EPA Response:. Reported data that are below the laboratory reporting limit but above the

method detection limit (MDL) are still useable. The MDL is generally the lowest amount of a substance that can be detected by an instrument taking into account the type of sample. (i.e., soil, water, etc.), reagents, and sample, preparation. Due to the irregular nature of instrument or analytical method "noise", reproducible quantitation of a chemical may not be possible at the MDL. Generally, a factor of three to five is applied to the MDL to obtain a quantitation limit (e.g., laboratory reporting limit), which is considered to be the lowest level at which a chemical may be accurately and reproducibly quantitated. Typically, this data is qualified with a "J" flag, indicating that the chemcial was positively identified, but the associated numerical value is the approximate concentration of the chemical in the sample because the lab may not be able to accurately reproduce the result. These type of data are still useable and are appropriate to consider in making decisions regarding the presence of contamination.

3. Overall, the Township agrees that VOC concentrations for the Site are relatively low. The Township notes that several data points show exceedences of MCLs. The exceedances occur in wells MW-5, MW-6, MW-14, PZ-3, RW-2, and RW-3. MW-14 had the most exceedences (tetrachlolrethane, trichloroethane, and vinyl chloride). The Township notes that this well is located outside of the Site. Adding this area to the Site was discussed with the Township, and the Township feels the addition is necessary to the alternative plan. The exceedence at MW-6 reinforces this conclusion since that well is further downgradient.

   EPA Response: EPA agrees that continued monitoring of MW-14 is an integral part of the overall ground water remediation strategy at the Old City of York Landfill Site. MW-14 was installed as an additional monitoring well to monitor the plume which likely originates near RW-2 flows off-property at MW-14 and back onto the landfill property near MW-6. Sampling of MW-14 during the Third Quarter 1998 sampling event revealed the presence of certain VOCs above their respective MCL. However, three subsequent rounds of sampling have not shown any MCL exceedances. Nonetheless, monitoring of MW-14 is necessary to support the natural attenuation determination.

4. The Township observes that three of the five recovery wells had VOC exceedances. The Township feels that exceedences in the recovery wells are significant because this demonstrates that the wells continue to draw contaminants from hotspots at the Site. The Township views this data as proof that ground water recovery are working to some degree. The Township notes with alarm that the Waldman well, located approximately 2,000 ft. west of the Site's southwestern boundary, exhibited a lead concentration above the EPA action level for lead. The Report dismisses this as not Site-related due to the distance. However, on-site ground water was not tested for lead and therefore the Township disapproves of the Report's conclusion about the source of lead. The Township questions whether this conclusion is appropriately conservative in the absence of more conclusive proof.

   EPA Response: EPA agrees that the ground water extraction and treatment is system is working to some degree. However, given that ground water VOC levels are so low, the pump and treat system is removing only a relatively minor amount of VOCs compared to the natural attenuation processes at the Old City of York Landfill Site and continued operation

provides only marginal additional benefit towards the remediation of ground water at the Site. With respect to the Waldman well, EPA is aware of the lead in his drinking water well. EPA undertook additional steps to conduct a thorough evaluation of Mr. Waldman's drinking water several years ago. This included obtaining samples from several locations within his home's plumbing system and his well. EPA informed Mr. Waldman of these exceedances at the time. The Township is correct in that on-site ground water is not currently being monitored for lead. Contaminants of concern at the Site include VOCs. Inorganic sampling was conducted during three separate rounds during the original remedial investigation. Lead was not identified as a contaminant of concern for ground water at the Old City of York Landfill Site. Lead was not detected consistently in the monitoring wells installed at the Site as part of the remedial investigation; and except for one location, it was not detected near the levels of those in his residential well. In fact, in monitoring well MW-9 which is located directly upgradient of his well, lead was detected at a concentration of only 1.2 ug/1 in an unfiltered ground water sample. Lead was also detected in an unfiltered ground water sample from well WP-3 at 109 ug/l; however, since this result is from an unfiltered sample, the lead is probably particulate in nature (rather than dissolved in ground water) and would not be expected to be mobile in ground water. Furthermore, based on ground water elevation data, ground water at WP-3 is not expected to flow toward the Waldman well. Therefore, it is highly unlikely that the lead detected in WP-3 is associated with the lead detected in his well water.

5. Cadmium, copper, lead, mercury, selenium, and thalliurn had chronic AWQCs below the laboratory reporting limit. Therefore, the Township notes that for these metals lack of a reportable quantity does not mean the chronic AWQC has not been exceeded.

   EPA Response: See Response to comment 2 above.

6. The Township observes that Seep Water 4 (SPW-4) exhibited a lead concentration of 24 ug/l. This is more than 5 times the chronic AWQC for lead (AWQC is 5.5 ug/L and EPA action level is 15 ug/1). The Township notes that this result is a sharp increase from previous years which exhibited levels below the laboratory reporting limit. The Township is alarmed by this result because of the distance from any hotspot and the relative lack of testing closer to hotspots. Lab equipment was double-checked to confirm the validity of the results. In particular, the Township feels this result raises concerns about whether lead and other contaminants have yet reached their peak concentrations at the Site.

   EPA Response: Surface water and sediments are monitored at the Old City of York Landfill Site on an annual basis. The Focused RI Report notes that lead concentrations during the 1993-1997 time period were below the calculated AWQC, and that the 1998 sampling event represents a notable deviation. Subsequent sampling during the September 1999 monitoring event revealed that the lead concentration at SPW-4 was 11 ug/l, again exceeding the calculated AWQC. EPA has stated that is not appropriate to directly apply AWQC directly to the seep areas because the seep areas are not the point of first designated use of the agrees that these lead concentrations warrant attention and surface water. Nonetheless, EPA agrees that these lead concentrations warrant attention and

closer review. However, surface water impacts fall under the scope of the 1991 ROD, and therefore, EPA will pursue the appropriate course of action under the ARARs as cited in the 1991 ROD. Pursuant to the 1991 ROD, EPA will make ah determination during the five-year review if further seep sampling is warranted and what, if any, corrective actions are necessary to address seep and stream water at the Site and ensure protection to human health and the environment.

7. The Township points out that the discussion of mercury found in SW-2{p.4-4} demonstrates the inadequacy of the testing procedures for the chosen AWQC parameters. Mercury concentrations exceeded the chronic AWQC but were still below reportable limits. The Report generates a graph and hints that the results show a declining trend in mercury concentrations. The Township feels this conclusion is inappropriate. None of the data points used to generate the graph is reliable. The Township observes that the only reliable conclusion that can be drawn from this data is the presence of mercury at SW-2.

   EPA Response: See Response to Comment 2.

8. Surface and sediment VOCs and SVOCs were not monitored after 1996. The Report draws the conclusion that the extraction wells have no impact on these parameters due to the distance between the hotspots and the monitoring locations. The Township notes that Tables 4-3 and 4-5 do not fully support this conclusion but also observes that concentrations of surface and sediment VOCs and SVOCs at the Site are probably too low to raise any real concerns at this time.

   EPA Response: EPA agrees with the Report's assessment that because of the relatively significant distance between the extraction wells and the streams and seeps sampled and the relatively limited area of influence of the extraction wells that no impact on flow of the streams and seeps or their quality would be expected. EPA also believes that Tables 4-3 and 4-5 of the Report support this conclusion since an evaluation of these tables reveals that total VOC and SVOC concentrations remained virtually identical for pre- and post-ground water treatment system extraction .

9. The Township notes that natural attenuation is a very difficult phenomena to demonstrate. The Site is not abiotic and therefore some degree of natural attenuation will occur. The Township feels the difficulty lies in persuasively showing that the process is sufficient to meet and maintain remediation goals and protect the health and well-being of Township residents. The Township understands that proving natural attenuation is difficult because of its highly complex nature. The Township also understands that, at best, most conclusions drawn about natural attenuation processes will be hypotheses based on assumptions that are scientifically uncertain.

   EPA Response: EPA agrees that verifying that natural attenuation through biodegradation processes is a complex process. However, natural attenuation processes do not rely solely on biodegradation but also on other processes as described in the Proposed Plan and ROD

Amendment such as dilution, dispersion, sorption, volatilization, etc. As EPA has stated, biodegradation is not the primary mechanism of attenuation but rather dilution and dispersion are the primary factors.

10. After reviewing the Report, the Township observes that the location of the hotspots in well drained soils atop hills makes natural attenuation unlikely as a dominant process. The Township feels that dispersion and dilution will likely be the more dominant processes.

    EPA Response: EPA agrees; See response to Comment 9 above.

11. The Report offers three lines of evidence for demonstrating natural attenuation: (1) stable or decreasing concentrations of contaminants; (2) biogeochemical conditions favoring degradative activity; and (3) presence of microbial activity capable of degrading the contaminants of concern. The Township feels the first line of evidence provides the strongest data and should be weighted appropriately. The Township regards the second and third lines of evidence as merely supportive because, as noted above, the natural attenuation process is too complex to draw conclusions from isolated parameters. The Township also notes that the third factor has not even been uniformly adopted by EPA.

    EPA Response: EPA agrees that biodegradation is not the primary natural attenuation mechanism at work at the Site, rather dispersion and dilution are the primary factors involved with the natural attenuation processes at the Site. EPA has relied on the first line of evidence in evaluating and determining if natural attenuation is taking place at the Old City of York Landfill Site. EPA does not believe that biodegradation is proceeding to an appreciable extent and has not drawn any conclusions from the second and third lines of evidence.

12. The Township submitted several comments with respect to the biodegradation process taking place at the Site and the geochemical and microbial information gathered during the site investigation to determine if conditions are appropriate for biodegradation to occur at the Site.

    EPA Response: *The Alternative Ground Water Remedy Evaluation Report* was carefully reviewed by technical experts at EPA's National Risk Management Laboratory, Subsurface Protection and Remediation Division in Ada, Oklahoma. Technical comments regarding the biodegradation potential are contained in the administrative record. It is EPA's opinion that biodegradation is not the primary attenuation mechanism at the Site but rather dispersion and dilution are the primary natural attenuation processes responsible for the reduction in contaminant concentration.

13. The Township feels the first line of evidence is unsupported by the data presented. First, historical data used for comparison of 1996 conditions to 1998 conditions may be biased because of the different testing times. The 1996 data was collected in May, likely corresponding to peak rainfall events. This could cause maximum leaching from hotspots

and above average contaminant concentrations at testing locations and maximum dispersion throughout the Site. Dilution could also occur if rainfall events produce elevated ground water flows. The 1998 data was collected in August, likely corresponding to peak drought conditions. This could minimize leaching and dispersion from hotspots and cause below average contaminant concentrations at testing locations within the Site. The data should have been collected during the same seasons or the collection times should have been reversed in order to produce conservative estimates. As such, the Township feels the calculations based on these data sets should not be considered

EPA Response: EPA disagrees with the Township that the first line of evidence is unsupported by the data presented. The data set prior to the operation of the pump and treat system were evaluated from some ground water monitoring points such as monitoring well MW-5 and the Boser well. EPA did not rely solely on comparing May 1996 to August 1998 data. The data collected at these wells, 16 samples since December 1983 through May 1996 for the Boser well and nine samples since October 1988 through May 1996 at MW-5 collected prior to pump and treat, indicate a decreasing trend in contaminant concentration (Figures 5-6 and 5-7, appendix H and I, RUST, November 1998). This decreasing trend is the first line of evidence that natural attenuation is occurring. Because of the low contaminant concentrations (only slight MCL exceedances at a few well locations) and the decreasing trend observed at the wells through time, EPA concludes that this Site would be a good candidate for a monitored natural attenuation remedy. EPA does acknowledge the Township's concerns regarding uncertainty associated with interpretation of a limited data set, and as part of this and any monitored natural attenuation remedy, its implementation will include monitoring of ground water to measure its progress to reach the ground water cleanup goals and guarantee that it is protective of human health and the environment. Additionally, the ROD amendment contains a contingency remedy of pump and treat if the ground water monitoring demonstrates that the monitored natural attenuation is not facilitating the aquifer to meet the cleanup levels or if it is no longer protective.

14. A comparison of Figures 5-4-and 5-5 seems to indicate that extraction has been somewhat successful at concentrating the extent of contamination. Figure 5-4's depiction of Area 3 would be significantly changed with the addition of MW- 14 and would extend the extent of Area 3 contamination depicted in Figure 5-4. Figure 5-5 seems to show a concentration of contaminants around the extraction wells. Most notably, the plume extending in a southwest direction from Area 3 in Figure 5-4 has been eliminated in Figure 5-5. Had MW-14 existed in 1996 the plume would have likeiy been larger and thus concentration effects in 1998 may be understated by Figure 5-5. Contamination around Area 1 also seems to have been concentrated by the extraction wells.

EPA Response: Because monitoring wells MW-13 through MW-14 did not exist during the second quarter 1996 and the data are representative of different seasons, EPA acknowledges that it is difficult to compare them to make conclusions regarding the effectiveness of the pump and treat. The extraction well locations were selected at the most highly

contaminated wells, in fact some of the extraction wells are located beneath the landfill waste. Therefore, the isoconcentration maps prior to and after pump and treat should show contaminant concentrations at and around the, pumping wells, which is the case. We do acknowledge that the pump and treat has removed some ground water contamination; however, given the low contaminant concentrations observed in the influent to the treatment plant as compared to the estimated reduction of ground water contamination overtime, pump and treat does not appear to be providing significant additional benefit in removing the ground water contamination. Continued monitoring of these most recent monitoring wells will be part of the MNA. Furthermore, if monitoring results indicate that MNA will not achieve the cleanup standards or is no longer protective of human health, the contingency remedy of pump and treat shall be implemented.

15. The Township notes that contaminant concentrations around the extraction wells should be lower in 1998 than in 1996 due solely to operation of the wells. The wells are pulling contaminants in from the surroundings but the contaminants are promptly extracted and do not have a chance to accumulate. Thus, when analyzing the isoconcentric maps presented by the Report, the Township feels it is more important to note the changes in the geographical area affected by the contamination rather than actual contaminant concentrations.

    EPA Response: When evaluating the effectiveness of a pump and treat remedy, it is common practice to depict the contaminant concentrations on a Site map for different sampling events to observe the effect of pumping on the contaminant concentrations over the Site (i.e. contaminant plume). Some of the extraction wells are located beneath or at the edge of the landfill. EPA does take into account the contaminant concentrations and the distribution of this contamination over the Site area and evaluates the area affected by ground water contamination. During the implementation of the monitored natural attenuation, monitorin of ground water to measure its progress to reach the ground water cleanup levels to guarantee that it is protective of human health and the environment shall be performed.

16. The Township observes that the Report gives a very basic “back of the envelope” calculation for the mass of subsurface dissolved VOCS. The Report admits the shortcomings of this method. The Township notes that the Report then compares this estimate to a much more accurate calculation of VOC recovery rate in extraction wells. The Township understands that this comparison may be useful due to the size of the discrepancy between the results (11 lbs. per year versus 1 lb. per year). However, the Report draws the conclusion that this much of this discrepancy may be attributed to natural attenuation. The Township feels such a conclusion is baseless. Many factors could be causing this result. Due to the well-drained nature of the topography and the highly variable hydraulic conductivity of the Site, the Township would first suspect dispersion and dilution as the main cause of the mass disappearance. Under these circumstances, the Township observes that dispersion and dilution, natural attenuation, and recovery wells are most likely all contributing to the mass disappearance phenomena.

EPA Response: EPA acknowledges that natural attenuation, most notably dispersion and dilution of contaminants, are contributing to the observed decrease in ground water contamination overtime. Pump and treat also is contributing to the reduction of ground water contamination. Based on the analysis of the data it appears that most of the reduction of ground water contamination is due to natural attenuation processes when compared to pump and treat.

17. The Township observes that the regression analysis is incomplete and does not demonstrate the trend the Report seeks to prove. The Township feels a regression analysis showing a *statistically significant* decreasing trend of VOC concentration prior to commencement of recovery would offer stronger evidence of natural attenuation. First, only two wells contained enough data prior to 1996 to perform regression analysis. As discussed before, the variability of the Site makes generalizations based on such isolated data tenuous at best. Second, the regressions performed are inconclusive. The Report gives an accurate analysis of r and r parameters. The regression has an r, of 0.70 which is adequate but by no means strong. The Report offers no explanation of p-values for the regression. The p-value measures how likely the observed deviation in the results could be explained by random variation as opposed to the hypothesized effect. The p-value is necessary to determine if the results have *significance*. Without any analysis of p-value the Report states that there is a significant decreasing trend in VOC concentrations over time. The Township suggests this conclusion may be premature without an explanation of the p-values for the regression.

    EPA Response: Although the regression analysis provides a useful tool for forecasting the rate at which natural attenuation may occur, there are inherent uncertainties that may cause the actual results to vary from the forecast outcome. Such uncertainties may include: (1) the presence of continuous sources in the landfill areas: (2) effects of eventually shutting down the pump and treat system which may result in changes to contaminant concentrations and geochemical conditions due to the change in the aquifer flow regime; (3) the number of data points on which the regression analysis is based as well as whether the data has been collected at an adequate frequency to represent seasonal fluctuations; and (4) the evolution of daughter products related to natural attenuation. EPA acknowledges that there are limitations in utilizing a regression analysis. However, EPA did not rely solely on the regression analysis in making its determination to change the ground water remedy at the Old City of York Landfill Site to monitored natural attenuation. The regression analysis was only one of several factors EPA considered in its overall evaluation of the Site, including the level of contamination, stability of the contaminant concentrations, and the efficiency of the ground water pump and treat system.

18. The report draws several conclusions concerning historical VOC concentration trends from graphs of raw data collected in Areas 1 and 3. The Township feels these conclusions are inappropriate without first showing some type of statistical relevance to the data. Figure 5-6 may show a declining trend for MW-5 however, as discussed above, the trend in the data prior to 1996 is questionable. The data offered for RW-3 shows no trend prior to May 1996. The Township feels the Report's conclusions regarding this data are unsupported.

EPA Response: An exponential regression analysis was performed on MW-5 data that was collected prior to the pump and treat operation and the results indicate that there is a strong correlation for the decreasing trend in contaminant concentration at MW-5 with time as explained in Section 5 of the *Ground Water Remedy Evaluation Report.* EPA agrees that there is insufficient data for RW-3 to evaluate contaminant trend overtime prior to the pump and treat operation. Nonetheless, RW-3 is located beneath landfill waste and therefore would not be an appropriate location to monitor the progress of a ground water cleanup. The contaminated ground water at the edge of the waste and beyond shall be monitored to evaluate the progress of the MNA remedy to meet the cleanup objectives. Both MW-5 and MW-6 are monitoring wells located at the edge and down gradient of the waste. The regression analysis for both wells on the data collected prior to pump and treat indicate a decreasing trend.

19. Data in Figure 5-7 shows nothing conclusive. The Report concludes from that Figure that the Boser well was showing a downward trend in VOC concentration prior to May 1996. However, the majority of the decline occurs between two data points. The Township observes that this is an alarming gap in the data which the Report makes no attempt to explain. Most likely, some external event occurred around this time that has significantly skewed the data. Therefore, the Township feels that conclusions drawn from this data would be unsupported.

    EPA Response: The conclusions drawn from Figure 5-7 are supportable. Routine quarterly monitoring of the wells at the Old City of York Landfill Site did not begin until June 1995. Prior to this time, monitoring occurred in support of different events. Monitoring in the early 1980's was associated with the initial assessment of the Site and for inclusion on EPA's Superfund National Priorities List. Monitoring conducted in the late 1980's and first part of 1990 was in support of the original remedial investigation conducted at the Site. Monitoring from 1993 - 1995 was in support of designing the current ground water extraction and treatment system for the Site. While the reason for the sudden drop of VOCs in the Boser well from May 1986 to October 1986 may not be obvious, it may be attributable to natural attenuation. What is apparent is that the overall VOC levels have been generally declining over the approximate twenty year history that this Site has been monitored. Such a decline in VOCs would be expected in landfills which are not capped with an impermeable cover. In this type of situation, landfill contaminants slowly leach from the landfill mass thereby depleting the original contaminant materials contained in the landfill.

20. The Township notes that the spatial variation of concentration data does not clearly support the conclusion the Report draws. The spatial variation is probably caused by dispersion and dilution as well as natural attenuation. The data presented in the Report does evidence some type of degradation ***or*** dilution. However, data was only used for one year which means the graph does not have any historical significance. The Township feels that a better graph would have presented data points since 1996.

    EPA Response: EPA agrees that dilution and dispersion are the primary attenuation

mechanisms taking place at the Site. EPA did not rely solely on the spatial variation of concentrations of the contaminant plume in making its decision. Typically, a contaminant plume will decrease in concentration with distance from a source area. In this case, EPA is more interested in contaminant concentration declines in fixed monitoring points with respect to time so generation of another graph including data points since 1996 would not provide significant additional information.

21. The Report suggests that natural attenuation together with institutional controls will be capable of achieving MCLs as established by the Site ROD. As discussed above in Section III, the Township questions the extent to which natural attenuation will contribute to achieving this result. The institutional controls relied on by the Report are similar to the deed restrictions placed on the Boser property: "No wells, ponds, impoundments or other structures or facilities for the recovery of ground water or surface water shall be constructed or used to recover water from on or beneath the Property for any purpose, including home, commercial, agricultural or industrial use, irrigation, cooling, or other use." The Township notes that the restrictions placed on the Boser property as outlined in Section 2.1 of the Report are actually stricter than this. According to the portion of the Report the restrictions further include limits on recreational use and further development or subdivision of the property. The Township finds these institutional controls unacceptable in the long-term.

    EPA Response: EPA believes that natural attenuation processes, mainly dispersions and dilution, will achieve MCLs. The additional institutional controls contemplated for the Old City of York Landfill Site are separate and should not be as restrictive as the restrictive covenant on the Boser property. The institutional controls on the Boser property are more restrictive because 56 acres of the 178-acre tract are landfill areas which may not be disturbed. The institutional controls contemplated for adjacent properties may include ground water extraction restrictions for existing ground water wells and/or restriction of new well installations, as necessary, as not to inadvertently draw contamination off the property. No other effects should be observed by the residents as far as any other use of their land for any purpose.

22. The Township draws attention to the fact that the site ROD originally required clean-up to background levels but was later changed to specify clean-up of nine contaminants to MCLS. The Site has not achieved the established goals of the revised ROD. Now WMI seeks to do this in conjunction with institutional controls (which is acceptable by EPA guidelines). However, the Township feels that the institutional controls required render the land useless and, based on the Report's inability to adequately prove natural attenuation, would essentially release WMI from achieving the goals of the ROD and remediating the Site. The Township does not feel this outcome is appropriate at this time. The Township is not persuaded that the institutional controls suggested by WMI will return the land to a useable state nor does the Township feel they are consistent with the goals of the ROD.

    EPA Response: EPA disagrees with the Township's assertions with regard to the cleanup levels and the impact of the institutional controls. The goal of this ROD Amendment is the

same as the goal of the original 1991 ROD. The ground water must be cleaned up to drinking water MCLs throughout the area of attainment. The method of how MCLs are to be achieved, however, has changed. Based upon the information available, it appears that natural attenuation processes are as likely to continue to reduce contaminant concentrations to MCLs as is continued operation of the pump and treat system and will do so in a similar time frame. The purpose of the institutional controls is to provide an additional protective measure to ensure that the contaminant plume is not inadvertently drawn off-property until the goal of achieving MCLs is met. They should not prevent productive use of the land. In the unlikely event that the monitored natural attenuation remedy does not work and more active means of ground water cleanup are necessary, the pump and treat remedy will remain as a contingency.

23. The Township feels the Report understates the effectiveness of the current remediation strategy. The extraction wells do seem to have concentrated contamination and eliminated the plume extending in a southwesterly direction from Area 3. Conversely, the Township feels the Report overstates the effectiveness of natural attenuation. As discussed in Section III, the Report has not shown adequate evidence of sufficient natural attenuation at the Site. Moreover, the Township disapproves of the suggested institutional controls.

    EPA Response: See Response to Comment 14 above. It appears that there is enough evidence to demonstrate that natural attenuation is occurring at the Old City of York Landfill Site. EPA acknowledges the Township's disapproval of the institutional controls; however, the modified remedy is the most practical and practicable course of action for this Site given the limitations of the pump and treat system in remediating such low levels of contamination in the ground water at the Site.

24. The Report states that pumping from extraction wells has not significantly reduced off-site migration of contaminants. This conclusion may be incorrect. Pumping from the extraction wells has reduced migration from hotspots and consequently off-site migration.

    EPA Response: Pumping of the extraction wells has not significantly altered ground water flow patterns and the cone of influence of the extraction wells is limited in extent. Therefore, it is unlikely that off-site migration of contaminants has been significantly influenced by the operation of the ground water extraction system.

25. The fact that current remediation has not achieved the established MCL goals of the ROD is not a basis to abandon the remediation strategy unless a more effective strategy is proven and adopted. Natural attenuation has not been shown capable of achieving the ROD's established goals. Without better evidence of effectiveness, the Township does not approve of this remediation strategy as an acceptable alternative for achieving compliance with MCLs.

    EPA Response: The current pump and treat system is not being abandoned because it has not achieved MCLs in ground water. The pump and treat system remedy is being

discontinued because it is providing only marginally additional benefit toward achieving MCLs beyond the natural attenuation processes at the Site and its continued operation is not practicable. EPA believes that monitored natural attenuation is appropriate for the Old City of York Landfill Site. The aquifer will continue to be monitored to ensure that the contaminant plumes are stable or decreasing in extent. Should this monitoring reveal that monitored natural attenuation is not protective, the pump and treat system will be used as a contingency measure.

26. Again, natural attenuation has not been adequately proven effective over the long-term. The Township sees no reason why WMI should be allowed to alter the current remediation strategy until the ROD established MCL goals are met or an effective alternative remediation strategy is adopted. The Township does not believe the alternative plan achieves these goals.

    EPA Response: As EPA has stated previously, monitored natural attenuation should be as effective as continued operation of the ground water extraction and treatment system in achieving the goal of remediating ground water to MCLs. EPA is also convinced that, based on an evaluation of long-term effectiveness, monitored natural attenuation should be as effective as the current remedy in the long-term.

27. The Report acknowledges the efficacy (albeit not highly efficient) of ground water extraction. The conclusion that changing to a natural attenuation strategy would promote anaerobic activity is unsupportable and even directly refuted by some evidence.

    EPA Response: As previously stated, biodegradation is not the primary attenuation mechanism taking place at the Site. EPA is relying on the dilution and dispersion aspects of natural attenuation to achieve the clean-up goals because of the low concentration of contaminants at the Site. Regardless of the anaerobic or aerobic conditions at the Site, the geochemical parameters at the Site are not entirely conducive to biodegradation.

28. The Report states that the risks associated with natural attenuation are acceptable based on levels of contaminants and the lack of pathways of exposure (i.e., institutional controls). This may be true but as discussed above the institutional controls are unacceptable and the level of risk without them is probably unacceptable also.

    EPA Response: EPA acknowledges the Township's position on the institutional controls. The purpose of the institutional controls is to provide an additional safeguard to ensure that the contaminant plume is not inadvertently drawn off-property which may result in a future exposure pathway for an off-property residence.

29. The Report acknowledges that the ground water extraction system is already in place and the technology being used has proven effective if not efficient or economical. However, efficiency comparisons with natural attenuation are difficult because the effectiveness of natural attenuation at achieving ROD established goals is not sufficiently supported by the

Report. The Report states that if remedial action would be required in the future either alternative could be implemented to achieve the goals. However, WMI has stated to the Township that the extraction and ground water treatment equipment would be removed if the alternative plan were adopted. The Township worries that this would make it extremely difficult to re-instate ground water recovery in the future. The Report states that the alternative plan is administratively feasible but requires *ongoing* enforcement of institutional controls. The Report does not suggest who will be responsible for ongoing enforcement and the Township fears this duty is likely to fall on it. The Township feels any alternative plan should account for this added enforcement burden on its own rather than relying on the Township.

EPA Response: Based on the available information, natural attenuation processes, mainly dispersion and dilution, should be effective in reducing contamination at the Site. However, as a safeguard, EPA has required in the ROD Amendment that should the contaminant plume begin to significantly increase in size, that the pump and treat remedy would be restarted as a contingent remedy. Should a contingent remedy be triggered, an Explanation of Significant Differences ("ESD") or ROD Amendment would be required. EPA will carefully evaluate the effectiveness of the natural attenuation remedy for several years prior to making any determination that the existing pump and treat system be abandoned. The institutional controls will provide another factor of safety in ensuring that contaminated ground water is not inadvertently drawn off-property. EPA acknowledges that Springfield Township does not want to incur any enforcement responsibilities with respect to the institutional controls and is not requesting that the Township do so in this ROD Amendment.

30. The Report's cost estimates seem valid although it is difficult to know this for certain without further independent research. The current plan is estimated to cost more over the life of the remediation. The additional cost is estimated to be $512,612 over 28 years or $18,308 per year. The proposed plan includes considerably less monitoring of the Site than the current plan. The Township draws attention to the fact that the Report is not completely clear on what the precise differences would be and this is probably still subject to negotiation between EPA and the responsible parties.

    EPA Response: The monitored natural attenuation remedy monitoring program has not been finalized, but it will cover key wells in insuring that natural attenuation processes continue to be effective and that the contaminant plume remains stable without significant increase in size. It may be likely that the natural attenuation monitoring may include the monitoring of fewer wells than under the previous pump and treat remedy.

31. Finally, be assured Springfield Township, York County, Pennsylvania has no intention to impose "Institutional Controls" on the area here at issue. This precludes a Zoning Ordinance Amendment, any general ordinance, any Subdivision and Land Development Ordinance amendments, Resolution(s) or any other regulatory action. It is unfortunate that the property owners shall bear the brunt of this Alternate Plan via their inability to sell their land at its once fair market value or, probably, unable to even give it away. These people must now

cope with the EPA's "walking away" from this problem as will WMI.

EPA Response: EPA acknowledges that Springfield Township has no intention of imposing any institutional controls as they may relate to the Old City of York Landfill Superfund Site, and is not requesting that the Township do so in this ROD Amendment. The institutional controls that are currently being contemplated should not have a significant, if any, impact on property values.

C. Comments Submitted by Potentially Responsible Parties

1. A PRP noted that EPA listed various corporations that are responsible for the cost. The commentor asked if additional corporations would be involved and who would be dividing the cost, and when would negotiations begin.

   EPA Response: EPA has issued approximately 26 additional General Notice Letters (GNL) to various companies notifying them of their potential liability with respect to the Old City Of York Landfill Site. EPA's goal is to bring these additional parties to the negotiation table with the current PRPs to negotiate a settlement for the remaining costs at the Site. EPA has not set a negotiation timetable, however it is EPA's desire to complete these negotiations in a timely manner.

2. While WMPA agrees that the PRAP, and subsequently the ROD, should provide for a means to trigger a contingency should Monitored Natural Attenuation (MNA) with Institutional Controls not prove protective of human health and the environment, we do not believe that ground water extraction and treatment should be predetermined as the most effective contingent remedy. We believe that the data generated during subsequent monitoring may provide the Agency additional information on which to determine the most effective contingent remedy. This will allow for the application of any appropriate technology, should a contingency be triggered. As discussed in the PRAP, the ground water extraction and treatment system is only marginally effective. It would therefore seem more appropriate to allow for flexibility in the PRAP/ROD to determine if more appropriate contingent remedies may be available. EPA itself has documented that ground water pump and treat systems are typically ineffective in achieving ground water cleanup levels, particularly when compounds are at low levels, such as at the Site. We suggest that the potential contingent remedy(ies), as well as triggering criteria, be developed in the O&M Plan to be approved by the Agency, with input from the various Site stakeholders.

   EPA Response: EPA believes that for the Old City of York Landfill Site that ground water pump and treat would be the most effective contingency. This does not mean however, that the pump and treat cannot be modified (i.e., more extraction wells) to increase its effectiveness, if necessary. Identifying contingent remedies and triggering criteria in the O&M plan is not appropriate since the Record of Decision forms the legal basis for the selection of a remedy. Should a contingency remedy be triggered, an ESD or ROD amendment would be required which would allow for input from the various stakeholders.

3. The **Summary of Alternatives: (Page 11, Paragraph):** states that "in the event that the monitoring results reveal that the plume is expanding and/or natural attenuation processes are not protective of human health or the environment." Most troubling here is the "and/or" clause. This would seem to indicate that either condition would trigger the restart of the pump and treat system. As stated in the PRAP, the mechanisms of MNA include dispersion. Dispersion of contaminants by definition may be characterized as "plume expansion". We do not believe the Agency intends to trigger a contingency for minor changes at the margins of the plume which would pose no additional or unacceptable risk to human health and/or the environment. In fact, what may appear to be expansions of the plume may only be the result of enhanced detection capabilities during ground water sample analyses or the statistical variation in sample results. Consistent with the text of the PRAP in Paragraph 2 on Page 11, the contingency should be triggered only if the MNA with Institutional Controls remedy were found to pose an unacceptable risk to, or not to be protective of, human health and/or the environment. We, suggest that the protocol for determining such protectiveness should be described in the Operation and Maintenance (O&M) Plan which will be approved by the Agency.

   EPA Response: EPA does not intend on triggering a contingency for minor changes at the margins of the plume which would pose no additional or unacceptable risk to human health or the environment. The language in the ROD Amendment has been reworded to state " in the event that monitoring results reveal that the plume is *significantly* expanding and/or natural attenuation processes..." to address the plume expansion issue. EPA has determined that the contingency should be triggered should either condition be met.

4. **Section VIII - Summary of Alternatives: (Page 11, Paragraph 1):** "This monitoring program will consist of 30 years of quarterly sampling with potentially reduced frequency for some or all of the monitoring wells to semiannual or annual thereafter based upon statistical evaluation of the first 8 quarters of data."

   WMPA interprets the above language to mean that the entire monitoring period will be thirty (30) not that an additional thirty (30) year quarterly monitoring program will be required. Since the remedial action began in 1995, the monitoring program in 1999 is already in its fourth year. Therefore the remaining monitoring period should be adjusted to account for the portion of the period which has already elapsed. [Note that this reduction is consistent with the language in Section IX. - Evaluation of Alternatives and the Preferred Alternative, Subparagraph G. - Cost, Page 14, which indicates the" ...anticipated end of remedial action in 2025.']

   With regard to monitoring frequency, WMPA believes that the quarterly monitoring contemplated in the PRAP has already been conducted and that an additional eight (8) quarters of quarterly monitoring is not necessary and is not justified based upon historic quarterly ground water monitoring results for the Site. Monitoring results to date, including pre-pumping results, have indicated very little fluctuation in ground water quality on a quarterly basis. It is important to note that the basis for the proposed ROD amendment is

that ground water quality data have shown very limited ground water quality impacts and that the Site does not pose an unacceptable risk to human health or the environment. Requiring quarterly monitoring, while possibly appropriate where limited data exists, is not appropriate for the Site where extensive data is available. We believe that the exact nature of the monitoring program, including well selection, monitoring parameters, and monitoring frequency, is best developed during preparation of the O&M Plan. During the development and approval process of the O&M Plan, appropriate input can be obtained from the various Site stakeholders prior to final approval by the Agency.

EPA Response: EPA agrees that the first five years of monitoring toward the eventual remediation of the Site has been conducted and that 25 years are now remaining. EPA acknowledges that there is a significant historical ground water data base in relation to the Old City of York Landfill Site including historical ground water results prior to commencement of the current ground water extraction and treatment system. Nonetheless, eight quarters of monitoring should follow the discontinuation of the ground water pump and treat system in order to ideally assess ground water conditions under non-pumping conditions, unless WMI can demonstrate to EPA and PADEP's satisfaction otherwise. At a minimum, four consecutive quarters must be conducted after the pump and treat system is shut down to assess contaminant and aquifer response. In any case, if there is a significant expansion of the plume, especially off-property, following the discontinuation of the ground water extraction system, EPA reserves the right under this ROD Amendment to revise the scope and frequency of sampling, as necessary.

5. **Section VIII - Summary of Alternatives: (Page 11, Paragraph 2):** "The statistical analysis method and approach will be outlined in the Operation and Maintenance (O&M) Plan for the Site. For all samples which are "nondetect:, the detection limit concentration will be used when performing the statistical evaluation. The exact wells which will be utilized to monitor the natural attenuation processes will be determined in the O&M plan. Following the statistical evaluation of ground water data, if the data indicates that the plume has expanded and VOCs continue to migrate off-site at levels that pose an unacceptable risk to human health and/or the environment, and/or natural attenuation processes are not protective to human health and the environment, a contingency measure including restarting the existing pump and treat system will be implemented."

   Here again, we believe that the PRAP is overly specific and should modified to allow for developing data management protocols during preparation of the O&M Plan. If the statistical method will not be chosen until the development of the O&M Plan, it does not seem prudent to specify the handling of "non-detect" values in the PRAP/ROD. The appropriate methodology for handling "non-detects" can vary depending upon the statistical method chosen. Therefore, we suggest that the statistical methodology and the specific data management protocols be developed during the preparation of the O&M Plan.

   The above language of the PRAP also appears to suggest that VOCs are presently migrating off-site at levels that pose an unacceptable risk to human health or the environment. We

believe this may be misleading. We believe that the text of the PRAP should be consistent throughout and suggest the language found above, which ties the, triggering of a contingent remedy to non-protectiveness, is appropriate. We believe the amended ROD should reflect the triggering of a contingency to an unacceptable risk, not just the potential expansion of the plume or plume migration within the Site.

EPA Response: EPA has removed references to data management protocols from the ROD Amendment. EPA agrees these are better addressed during the development of the O&M Plan. EPA has clarified the above language by changing "... VOCs continue to migrate off-site at levels..." to "...VOCs migrate off-property at levels..." With respect to triggering the contingency remedy, please see Comment 3 above.

6. **Section VIII Summary of Alternatives: (Page 11, Paragraph 3.):** To reduce the potential for human exposure due to the Site, ground water extraction controls shall be implemented on nearby individual properties, as necessary, to prohibit or restrict ground water use within the immediate vicinity in order to prevent migration of the existing plume."

   As you know, the area surrounding the Site is served by a public water supply system and all properties within the "Proposed Ground water Usage Moratorium Area" currently use this public system for drinking, water. Further, Springfield Township has been enforcing a construction moratorium within the Site area which would appear to be sufficient to limit the potential for ground water usage. In addition, the landfill property currently has appropriate deed restrictions in place. WMPA questions the need for additional ground water usage restrictions at this time or as a condition of the remedy modification. As you are aware, the issues involved in attempting to place restrictions on private property are considerable. Since the need for any additional ground water usage controls would only be necessary to mitigate a potential future change in ground water usage in the area, we feel it should be considered as part of a contingent remedy. As such, the ground water usage controls would only be required if certain triggering criteria were met. We therefore ask that the Agency consider the need for any additional property controls as part of a contingent remedy, which we suggest is best developed as part of the O&M Plan.

   EPA Response: EPA understands that the issues involved in attempting to place institutional controls on private property are considerable. However, the institutional controls are an integral part of the remedy and need to be placed in order to ensure protection to human health and the environment. The purpose of the institutional controls is to restrict or prohibit ground water use in certain areas in order to prevent contamination from inadvertently being drawn off-property. The institutional controls are meant to be a proactive preventative safeguard. If EPA were to consider the institutional controls as part of a contingent remedy, rather than a preventative safeguard, they would be a reactive measure in response to contamination already being drawn off-property and potentially would not be as effective in protecting human health or the environment.

D. Comments Submitted by the Commonwealth of Pennsylvania

1. PADEP's Land Recycling and Environmental Remediation Standards Act (Act 2), Section 106 (a), specifically states that the regulations promulgated under Act 2, 25 PA Code Chapter 250, Administration of the Land Recycling Program, are ARARs under a CERCLA action. Remediation standards for ground water to surface water are found under Section 250.406 and specifically address 25 PA Code Chapter 93 (Water Quality Standards). Section 93.8 (a) refers to 25 PA Code Chapter 16 (Water Quality Toxics Management).

   EPA Response: PADEP has identified Act 2 as an ARAR for this remedy; EPA has, determined that Act 2 does not, on the facts and circumstances of this remedy, impose any requirements more stringent than the federal standard.

2. The Clean Streams Law Act of June 22, 1937, P.L. 1987, No. 394, as amended, 35 P.S. Sections 691.1 et. Seq., preserves and improves the purity of the waters of the Commonwealth for the protection of public health, animal and aquatic life.

   EPA Response: The Clean Streams Law is currently an ARAR under the 1991 ROD. Therefore, EPA does not plan on readdressing this ARAR in this ROD Amendment.